

POSTLMAYR, LAUREN MICHELLE, M.F.A. Rehab Code versus the North Carolina Building Code: A Comparison of Their Application in Preservation Tax Credit Projects, 2002-2012 (2013)  
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Current literature supports the importance of preservation as a means for revitalizing neighborhoods, improving local economy, and giving communities a sense of pride. However, an in depth exploration of which building code is best suited for use in rehabilitation projects in North Carolina has so far been missing. This research analyzed the application of existing building codes in relationship to preservation tax credit projects in Mecklenburg, Durham, Wake, and Forsyth counties. The researcher looked at projects completed between 2002 and 2012, gathering information about the building project, including the construction type, the use before and after the rehabilitation, location, applied building code, architect, scale, and cost. This information was then compared to reveal patterns within the decision-making process, and indentifying variables that should be considered in determining whether to apply the North Carolina Building Code or the Rehab Code.

The study revealed the North Carolina Building Code was chosen more often than the Rehab Code for projects utilizing preservation tax credits. The results further showed that a correlation existed between the selected building code and the construction type along with the use before and after the rehabilitation process. The data highlights the importance of considering the specific characteristics of a rehabilitation project in order to make an educated decision about which code to apply. Factors that should be considered include the project architect, the use before and after the rehabilitation, the building construction type, the scale, and the cost of the project. Therefore this thesis supports the current movement in North Carolina to combine codes for existing buildings into one complete document, allowing for selective combining of code requirements based on a project's unique characteristics.

REHAB CODE VERSUS THE NORTH CAROLINA BUILDING CODE:  
A COMPARISON OF THEIR APPLICATION IN  
PRESERVATION TAX CREDIT PROJECTS,  
2002-2012

by  
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Approved by

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## APPROVAL PAGE

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School at the University of North Carolina at Greensboro

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## **CHAPTER I**

### **INTRODUCTION**

The rehabilitation of existing buildings benefits the sustainability and environmental needs of the nation, provides a sense of pride to the community, improves the economic welfare of a town, saves historic main streets and mills, and provides affordable housing. When working with existing structures though, there are issues one would not normally have to face with new construction. One of the main complications is complying with building codes that did not exist when the structure was built or have been changed since the completion of the project. A structure needs to be brought up to code when it changes from its original function, an addition is made, interior walls are altered, and general faults are repaired (Pianca, 2002). The process of bringing a building up to code becomes more complex and time consuming as the building ages, making historic preservation difficult. Most building codes were designed for new construction, without consideration for existing structures, which creates a problem for both builders and developers when faced with existing buildings (Maurer, 2011). For this reason, codes were developed that deal specifically with existing structures. In North Carolina, for example, Chapter 34 and the Rehab Code address some of these issues.

Initially historic preservation projects were not affected by outdated codes because the buildings were being preserved and not adaptively reused. In the 1970's however, preservationists began focusing on saving historic buildings that were being slated for demolition. Through rehabilitation and adaptive reuse, iconic buildings could remain viable and valuable to the local community. Historic preservation was seen as a developmental tool, allowing communities a chance to revitalize their neighborhoods while boosting the local economy. The opportunity to

restore and reuse structures provided an occasion for sustainability and affordable housing to be completed at a larger scale, becoming more successful than before. This transition recognized the importance of providing a sense of place, maintaining the iconic main street, and saving historic mills so that each community could keep their unique historic built environment while allowing the buildings to meet the needs of the people who lived there. However none of this would be possible if codes did not begin to be adapted for existing structures. Codes like Chapter 34 and the Rehab Code are not only valuable to architects and designers but to building owners as well, because they allow buildings to be rehabilitated more economically and efficiently.

This thesis examines how Chapter 34 and the Rehab Code evolved and provides an understanding of how they are being applied to rehabilitation projects within North Carolina. These codes can be used for all existing structures, but in this thesis the researcher focused on how they are applied to historic tax credit projects. These types of projects allow the opportunity to see how Chapter 34 and the Rehab codes have been applied to historic structures while maintaining the historical significance of the building.

The research helps to answer the following question: What code is being applied more often to historic tax credit projects? Through an analysis of the relationship between the Rehab Code and Chapter 34 code implementation within historic tax credited projects, the researcher works to discover the reasoning behind why each code is chosen, how they are applied, and how they are being used within Wake, Mecklenburg, Durham, and Forsyth counties in North Carolina. These four counties were selected because they contain the largest number of tax credit projects within North Carolina, and they also happen to be four out of five of the pilot counties for the NC Rehab Code before it was adopted in 2003.

By comparing and charting the gathered data, patterns were discovered that raised some questions that helped to inform the research. One key question was whether the patterns in code

use were related to the following variables: construction type, the use before or after the rehabilitation, architects, scale, and cost of the project. The first question is valuable because it can help determine if one code is more beneficial than the other when dealing specifically with historic tax credit projects. The second question reveals different possibilities for why certain codes are being used within the project. Through the analysis of the gathered data, and cross referencing of the different components, a determination was made of what factors should be considered when applying each code to a building and how many projects use each of the two codes.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

#### *Historic Preservation*

Historic preservation is about recognizing buildings that hold significance in our country's history. According to Abele and Gammage (2000), "decisions about what is important are not made in isolation but reflect some broader social consensus about what is or may become important to society" (p. 9). There are four categories of significance that a building can fall into: the building can mark a specific event or historic trend that contributed to the development of a community, state or nation; the building can represent a person of interest's productive life; the building's features can relate to a particular class, be unique variations, show evolution, or the transition between resources; and the building or site may hold history that has not been discovered (Andrus, 1991). These properties are about representing and preserving the structure's physical qualities, distinct building periods, and integrity (Abele & Gammage, 2000). These types of structures are meant to tell the history of our country by showing the progression of architecture, while keeping the story of the building intact.

In the 1970's, historic preservation began to expand its focus to include the everyday buildings, like industrial complexes, urban commercial structures, and mills, that were often left for demolition. The movement became about rehabilitation and the adaptive use of historic structures. This redefined history, by keeping older structures and resources in use while revealing the building's history and character (Winter, 2010). The exterior of the building represented the historic significance while the interior displayed the preservation significance (Michael, 2010). Historic preservation had to begin focusing in on the process and getting beyond

the rules, changing the priorities to solutions. According to Winters (2010), “It will seek ways to respect historic resources while keeping them in use” (p. 27). This shift in historic preservation was not easily accomplished. It was met with many struggles and battles, but it did prevail, bringing preservation tax credits and existing building codes into play.

Rehabilitation projects come with support from the national and state level. They provide economic incentives, like tax credits, at both levels. The Federal tax incentives began in 1978 and since then have provided 2.35 million jobs, \$89 million in income, and \$121.2 million in gross domestic products (Bloustein, 2013). Since the creation of federal tax credits, over 38,700 projects have been completed (National Park Service, 2012). In 2012 alone they created 57,783 jobs, with 1,020 proposed projects and \$5.33 billion in approved rehabilitation work (National Park Service, 2012b). North Carolina is ranked third in the United States for completed, income-producing projects that use historic preservation tax credits (State Historic Preservation Office, 2013). To receive these tax credits a three-step process is followed. The end result of this process is to show how these rehabilitation projects have maintained the historic character of the structure. The buildings need to meet the Secretary of the Interior’s Standards for Rehabilitation, which has become more easily achievable since the creation of codes for existing buildings.

Historic buildings are a valuable aspect to any community. They provide opportunity for small business owners, they create a sense of place for the city, and they help reduce the waste of materials. These are just some of reasons why codes are being adapted to work with existing buildings. These types of codes are meant to preserve the sense of place and are a sustainable option when dealing with construction to revitalize a community, support the local economy, and provide affordable housing. With the use of codes for existing buildings, rehabilitation projects can help revitalize downtowns and restore a sense of place to abandoned communities.

### *Providing a Sense of Place*

According to Keister (1990), “There is a very strong psychological link between a community’s sense of itself – its identity – and the health of its downtown” (p.46). Downtowns help to form an identity for the community, creating a sense of place. “Historic Preservation [...] serves to return a sense of pride and optimism to communities large and small, rural and urban across the state(s)” (State Historic Preservation Office, 2013, p.4). Keeping the character of existing buildings intact is important, so that it can help “validate traditions, confirm our own identity, and make sense of the present” (Lowenthal, 1985, p.263). Historic buildings provide us with support because buildings tell the history of a community as whole. Structures can be used to describe the development of architectural styles within a town, show how a city evolved over time, and provide a timeline of how the city expanded. Not only can the rehabilitation of historic buildings ground a community by providing them with a strong sense of identity, but also it often can provide a much needed economic boost.

### *Providing Economic Development*

Working with existing or historic buildings can help to boost the economy within the community. Rehabilitation and preservation creates jobs, saves taxpayers money, and helps increase property value while improving community development (State Historic Preservation Office, 2013). Simply revitalizing a community’s downtown can boost its economy. Rehabilitation jobs do not fluctuate with the economy; instead they are able to provide their employees with stability in income and employment because projects can range in size from small to large (Rypkema, 2010). For example a local craftsman can work on projects as small as a window restoration or as large as built-in cabinets throughout an apartment. Overall rehabilitation work serves to return a sense of pride and optimism to a community despite its size and location (State Historic Preservation Office, 2013).



Increasing economic development through job creation is an important strategy for helping to maintain a community's pride and optimism. According to Rypkema (2006), "dollar for dollar, historic preservation is one of the highest job-generating economic development options available" (p. 48). This can be seen when comparing multiple jobs but most importantly it has a far greater impact than new construction on the local economy. This can be shown in Rypkema's (2006) comparison of the two. If a community were to spend one million dollars, "\$120,000 more will initially stay in the community with rehabilitation than with new construction. Some five to nine more construction jobs will be created with rehabilitation; 4.7 more new jobs will be created elsewhere in the community with rehabilitation; household incomes in the community will increase \$107,000 more with rehabilitation" (Rypkema, 2006, p. 48-49). Overall historic preservation creates jobs both during the process and after.

Another important aspect about historic preservation and the reuse of existing buildings is that they preserve taxpayers' money in more ways than one. The first is by reusing instead of wasting that which has already been paid for (Rypkema, 2006). These buildings already have the infrastructure and support system to run properly: roads, electricity, plumbing, etc., all of which has been paid for by the community (Powter & Ross, 2006). The second is by using downtown revitalization to prevent urban sprawl from occurring (Rypkema, 2006). By keeping the community more compact it reduces the use of taxpayers' dollars, because less infrastructure and public services, such as public transportation, phone lines, and public schools will need to be expanded. The third would be allowing valuable materials to be destroyed and end up in landfills instead of retained through rehabilitation (Powter & Ross, 2006). Many historic buildings were constructed to last long term, and they were built with materials that tend to cost too much for today's construction financial model. Further, historic preservation and the reuse of existing

buildings can allow the government the opportunity to use taxpayers' dollars on other important needs.

Historic preservation contributes in positive ways to the economy of a community, but most importantly it strengthens community development. When it comes to economics it is the different and unique community assets that raise demand and historic preservation saves unique structures. Property values tend to increase when rehabilitation happens within a neighborhood or a community (Rypkema, 2006). Historic preservation works with both economic development and community development without confrontations or sacrifices (Rypkema, 2006). The relationship between the two makes historic preservation a smart option for revitalizing a community's economy or development.

#### *Revitalizing Main Street*

Rehabilitation projects can be particularly beneficial for urban areas that have struggled with post war decentralization trends. Through downtown revitalization people began moving back into the city, revitalizing older buildings, and saving the states' historic main streets. Downtown revitalization needs historic preservation (Rypkema, 2010). Therefore codes designed around historic buildings and existing structures become invaluable, saving both time and money within rehabilitation projects. These projects used to take 16 months or longer to review and approve, resulting in millions of dollars being wasted on federally funded rehabilitation projects that can now be saved (Kapsch, 1981). These codes not only inspire people within the field to work with older buildings but also allow them to change buildings to meet their current needs. As these codes continue to evolve and be used within the community, their application has encouraged rehabilitation, adaptive reuse, and preservation of buildings that otherwise would have been torn down and lost for good (Syal, Shay, & Supanich-Golder, 2001). This is important to keep in mind, for once a historic building is demolished it can never be recovered and the

history will have been lost. These codes are not only about working with our existing structures and saving valuable resources but also about preserving our past and remembering our heritage.

An important iconic symbol in any city would be the commercial main street, lined with masonry structures that range in height from two to four stories. These buildings are an asset to any community because they provide a unique character that cannot be duplicated. Due to the mass suburban expansion that occurred after World War II, these downtown buildings tended to be neglected and abandoned. In the 1970s there remained thousands of small, mixed-use buildings located on the older main streets and in urban neighborhoods and when codes started recognizing existing buildings there was an opportunity to save our cities (Jackson, 2003). To help deal with these structures the National Trust started the Main Street Program in 1980 establishing the National Main Street Centers located in six states and supporting thirty towns (Keister, 1990). These cities were used to demonstrate strategies for community-based revitalization, showing examples of how downtowns could be saved. Over the last 33 years the Main Street Program has been implemented in over 2,000 communities, produced \$54 billion in investment, created 450,000 jobs, and rehabilitated over 229,000 buildings (“Welcome to National Main Street Center, Inc.,” 2013). The Main Street Program is about working with communities to help them recover and strengthen their economy by maintaining a strong city core.

The buildings in downtown originally served two purposes: first to provide commercial space on the first floor, and second to provide office or residential spaces on the floors above (Jackson, 2003). This previous pattern of use created issues when it came to bringing new life to the upper floors because, although the first floor could easily be renovated, it would cost more money to renovate the upper levels. The paths of circulation for egress were the main issue. Current codes required both the stairs being widened and at least two points of exits. Not until the

rehab codes came into play in 1998 was renovating the second floor even a viable plan for small businesses. According to Jackson (2003), “For many owners, renovating the upper floors of their Main Street Buildings for contemporary use is a necessary strategy for their long-term preservation”(p.33). Ninety percent of businesses hire 20 or fewer people, proving just how valuable these small business are to our economy (Rypkema, 2010). Therefore having codes that allow business to renovate not only their ground floor but also their upper floors provide great support.

### *Rehabilitating Mill Buildings*

In addition to urban areas, rehabilitation projects can also benefit rural areas, particularly through the adaptation of abandoned mills. Tobacco and Textile mills were built in the North Carolina piedmont between 1850 and 1930, in close relationship to the region’s industrialization (Rabun, 2009). These buildings tended to be massive brick masonry structures, ranging from one to four floors, with large windows and skylights. Mill structures were seen as staples in the community and tended to be the sole source of livelihood for the residents living in the mill village because they tended to be built in rural areas (Bodine, 2006). These manufacturers were important to rebuilding the southern economy after the civil war (Andrews, 1987). Besides being used for tobacco and textile manufacturing, the large factories were spaces where the mill village could gather for community events, ranging from political gatherings to religious services, rallies, official public meetings, and harvest activities (Yeargin, 2008). The modernization of technology in the twentieth century led to the decline of both tobacco and textile mills, bringing about the collapse of what has been a major source of employment within North Carolina and inflicting economic hardships on the surrounding communities (Hall, 2000).

Since the decline of manufacturing in North Carolina, industries tended to vacate and abandon these large mills, leaving them to decay (Bodine, 2006). These structures often lie in the

center of the community with access to public transportation and infrastructure systems already in place. They are symbols of the American manufacturing industry and therefore they need to be revitalized, as reminders to communities of their strength and success (Bodine, 2006). Through the rehabilitation of these structures, the buildings can once again be a staple for the community and assist with rebuilding the surrounding economy. Since the introduction of existing building codes, mill structures have been adapted for a variety of uses. Mills are large buildings and therefore tend to be adapted into mixed-use spaces containing apartments, retail space, room for special occasions, art studios, and offices. Some rehabilitation projects even include a space where political gatherings, religious services, rallies, official public meetings, concerts, and other performances can take place, similar to how a mill would have been used for the community living in the mill village. These rehabilitation projects can be used as part of the master redevelopment plan and community reuse strategy, serving as a reminder of the town's historic role (Bodine, 2006). Most importantly, by redeveloping a vacated mill, the opportunity to supply a new source of income and provide a sense of pride to the surrounding community helps to reinvent the mill village and save a part of North Carolina's history.

To assist with the redevelopment of these mills, the North Carolina Mill Rehabilitation Tax Credit, also known as the Mill Bill, was implemented in January of 2006. This program provided government support for the revitalization of mills throughout the state, by offering up to a 40% state tax credit, in lieu of the state's rehabilitation tax credit, that could be combined with the 20% federal investment tax credit ("North Carolina Mills Tax Credit," 2013). To receive this tax credit the structure must be a state or nationally certified historic structure, the original use of the building must be a manufacturing facility or an ancillary structure, the building must have been at least 80% vacant for at least two years, and once the work is completed the owner must receive an eligibility certification from the States Historic Preservation Office ("State Mill

Rehabilitation Tax Credit,” 2013). Overall this tax credit has assisted with twenty-four structures in the state of North Carolina since its implementation, bringing life back into the structures and therefore back into the community.

### *Sustainability and Historic Preservation*

Beyond the economic benefits of rehabilitation projects, the reuse of historic buildings is considered a sustainable option, because it saves money, energy, and materials while diminishing the amount of items being sent to landfills. Approximately one-third of landfills are construction materials and approximately one billion square feet of buildings are demolished and replaced with new construction every year in the United States (Frey, 2011; Rypkema, 2010). According to the Brookings Institute, around 82 billion square feet of existing space will be demolished and replaced between 2005 and 2030, which equals about one quarter of today’s buildings (Frey, 2011). Therefore the reuse of a building is a form of recycling that is extremely beneficial to any city because it preserves the history of our communities and saves us from negatively impacting the environment. The reuse of any structure tends to impact the environment less than new construction when comparing buildings that are of similar size and function (Frey, 2011). This supports North Carolina’s State Historic Preservation Office’s (NCSHPO) understanding that the “reuse of North Carolina’s existing structures supports both historic preservation and environmental sustainability principles and makes good economic sense” (SHPO, 2013).

Older buildings have inherently green aspects from their materials to their design. This can be seen in the “[n]ational data on building energy performance [which] indicates that some existing buildings, particularly those from the early 20<sup>th</sup> century perform as well as, or better than, modern day buildings” (Frey, 2011, p.18). Over the years, construction materials have been adapted and altered, and not always for the better. The quality and type of materials used in new construction, such as inferior fast-growing wood, increases the benefits for reusing an existing

building constructed with stronger slow-growth wood. Other benefits of existing buildings are the functioning windows that can help with the ventilation of a space. In addition, by using buildings that are already built, one can conserve energy and environmental cost by not having to demolish a building or transport the construction materials that would be needed to build a new structure (Sedovic & Gotthelf, 2005). Although there are some inherently “non-green” aspects to older buildings such as: lead paint, asbestos, and oil tanks; historic preservation is overall a positive aspect for the environmental and sustainable movement.

Building codes that address existing structures help benefit the environmental and sustainability movement by allowing for the reuse of existing structures. It has been said that the greenest building is one that is already built and codes for existing buildings provide developers with a new set of tools to incorporate existing buildings into their repertoire (Elefante, 2007; Frey, 2011). Historically building codes have not always recognized these structures but focused more on new construction. These new sets of codes encourage the adaptation and retrofitting of older structures, therefore supporting older communities and cities (Frey, 2011). It is about reusing that which we already have to its fullest potential without creating waste. The study done by Preservation Green Lab (2011) has concluded that, “reusing an existing building and upgrading it to be as efficient as possible is almost always the best choice regardless of building types and climate” (p.89). The research challenges the perception that new construction is actually more sustainable than the rehabilitation of an existing structure.

#### *Affordable Housing and Historic Preservation*

Rehabilitating older existing structures is not only more sustainable than new construction; it has other benefits as well. An example of this would be that by using existing structures, affordable housing can be created that not only meets smaller budgets but can become a “home”(Kapsch, 1981; Syal, Shay, & Supanich-Golder, 2001). Affordable housing has gained

an unwanted reputation of being cheap, dirty, and dangerous but by using structures that are already there, this reputation can be changed. Existing buildings provide the opportunity to spend money where it is needed instead of on construction, repairing the building, improving the safety requirements, and providing a decent place to live. According to Rypkema (2006), “That is what historic preservation has become. It isn’t about restoring buildings; it’s about restoring communities” (p. 50). By providing housing that is not only affordable but appealing, a sense of pride is returned to the community.

Over the years the need for housing has grown, especially when the baby boomers began looking for homes (Kapsch, 1981). This need also resulted in an ever growing need for affordable housing and according to Rypkema (2003), “You cannot build new and rent or sell cheap” (p.7). Existing buildings then provide the options to create affordable housing through rehabilitation. Rypkema reveals in his 2003 study, 32% of households below the poverty line live in older and historic homes, 31% of homeowners and 34% of renters whose income is less than \$20,000 per year live in older and historic homes, and 53% of all homeowner occupied and 48% of all tenant occupied older and historic homes have monthly housing costs of less than \$500 per month (2003). With the use of the existing building codes, it became possible to create safe, affordable, and attractive housing with a lower budget without losing the quality of the work. Rypkema states (2006), “It is time we acknowledge that for our communities to be reborn we have to have economic integration – and our historic neighborhoods provide the best environment for that to happen” (p.50). So far there is no evidence to prove historic districts cause property values to decline. In reality the evidence proves that it increases property value.

#### *Preservation Tax Credits*

Both Chapter 34 and the Rehab Code have been instrumental in helping to encourage adaptive reuse projects by allowing buildings to be updated while still maintaining their historical



character and keeping the surrounding community intact. Protecting these values gives them the opportunity to apply for Historic Tax Credits, providing incentives for rehabilitation of older buildings. The Federal Historic Preservation Tax Incentive Program offers 20 percent in federal tax credits for qualified rehabilitation project expenses (Bruechert, 2008). These tax credits were introduced in 1976 with the hope that they would promote historic preservation, therefore bringing life back into deteriorating communities. The tax credits match dollar for dollar reduction on taxes, but the project must be substantial and must exceed \$5,000 or the adjusted basis of the building (Bruechert, 2008). The work done to rehabilitate the building must meet the Secretary of the Interior's Standards for Rehabilitation, and the building must be certified as a historic structure by the National Park Service.

To receive these Tax Credits, there are some criteria that the building must meet, as well as an application process. The building must be considered a historic structure, whether it is recognized on its own or within a historic district, by the National Park Service (Bruechert, 2008). Next, it must be determined how substantial the rehabilitation work will be on the project and if it will exceed \$5,000 or the adjusted basis of the building. If both of these criteria are met, then the building can qualify for preservation tax credits. The next step is the application, which is a three-step process that needs to be completed sequentially at various stages during the rehabilitation work. Part one of the application needs to provide information that shows how the building is recognized as historic, which can include but is not limited to a historic district map and site plan that identifies the location of the structure (Bruechert, 2008). Part two needs to describe the condition of the building and what the rehabilitation work will be doing; this can include but is not limited to photographs, floor plans, and elevations (Bruechert, 2008). Both part one and part two should be completed and approved before beginning the rehabilitation work. Part three should be submitted after the completion of the rehabilitation work and will show how the

alterations and improvements meet the Secretary of the Interior's Standards for Rehabilitation; this will include new photos and documentation of the work (Bruechert, 2008). This process allows for the owner to complete rehabilitation work on a structure while insuring that the historic significance of the structure remains intact.

Since the introduction of Historic Preservation Tax Credits in 1978, they have proven their importance not only to historic preservation but to the growth and development of the economy in cities that complete multiple rehabilitation projects. The tax credits have generated over \$66 billion in the rehabilitation of income-producing historic structures (National Park Service, 2012), and have created over 2.3 million jobs (Bloustein, 2013). In 2012 alone, these tax credits led to the creation of 57,783 jobs, with 744 projects completed, and \$3.15 billion in rehabilitation work generated (National Park Service, 2012b). There are a total of 1.42 million properties listed on the National Register of Historic Places and of those properties, 20 percent of them are income-producing and can apply for the Federal Tax Credits (National Park Service, 2012b). Over half of the states provide historic tax credits that can be paired with the National Tax Credits. Of the 744 properties that were completed in 2012, 43% used state historic tax credits (National Park Service, 2012b). These tax incentives are not only meant to rehabilitate historic structures but they revitalize communities by creating jobs, enhancing property values, and rebuilding the character of the town.

The tax incentives have led to a rise in the number of rehabilitation projects in North Carolina. Since these tax credits were established, 971 projects have been completed in North Carolina. North Carolina ranks third in the country for certified projects in 2012 with 34 projects approved for historic preservation tax credit, meaning 34 buildings maintained their historic significance after they were rehabilitated (National Park Service, 2012). The 34 approved projects spent an average of \$106.7 million, \$87.8 million of which were certified expenses (National

Park Service, 2012). Since 1998 over \$1.36 billion dollars of private investment has been used on rehabilitation tax credit projects (State Historic Preservation Office, 2013). These tax incentives not only provide an opportunity to rehabilitate some of North Carolina's architecture, but they also create local jobs, therefore supporting the community, generating income, supporting the local economy, and stimulating tax providing support for the government.

### Federal Tax Incentives for Rehabilitating Historic Buildings 1977-2012

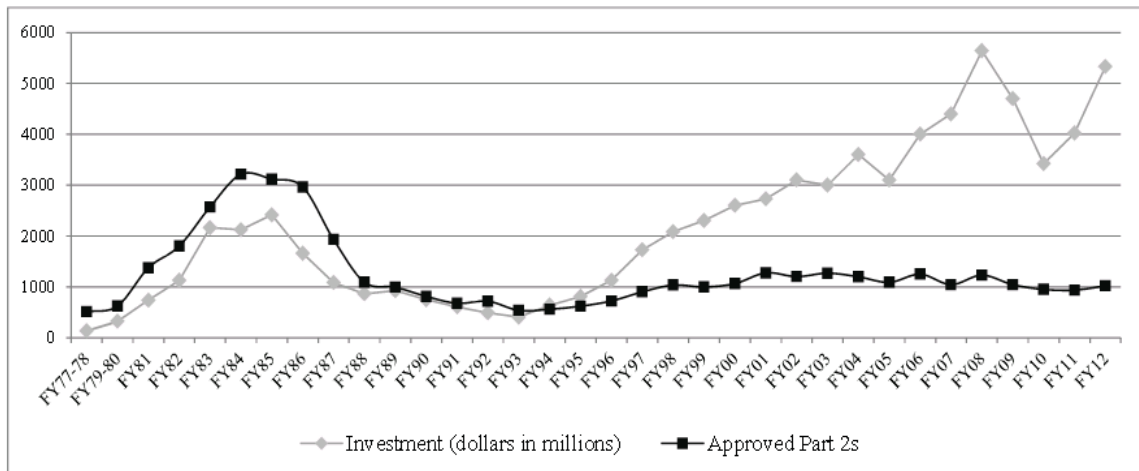


Figure 1. Federal Tax Incentives for Rehabilitating Historic Buildings 1977-2012: Shows the estimated rehabilitation investments and number of proposed projects approved by the National Park Service. Investment dollars above are not adjusted for inflation. (National Park Service, 2012)

### Exploration of Building Codes

#### Definitions

Building Codes are easily misinterpreted. Existing buildings and historical structures also have their own language that needs to be translated. Some of these terms will need to be understood before continuing on with the analysis of the Rehab Codes and Chapter 34.

When writing guidelines of any type, there are two different categories they can fall under: Performance and Prescriptive. **Performance-based codes** (Rehab Codes) provide a set of

standards that need to be met but do not dictate how these requirements are achieved. A performance approach allows any material, design or construction method as long as it meets the required level of performance (Hattis, 1981). While **Prescriptive codes** (Chapter 34) provide the designer/architect and building inspector with a strict guideline of what needs to be met. Prescriptive codes dictate acceptable materials, sizes, and methods of construction (Hattis, 1981). These two approaches determine how the guidelines are followed once applied. Performance-based guidelines provide multiple different outcomes while prescriptive guidelines are more regulated.

In this study, the researcher refers to multiple types of codes that each has its own shortened name. It is important to note that in this thesis **Building Codes** “describes all of the various safety and health requirements that a city imposes on construction projects, although in any given city the actual building code may be a separate document from the fire, health, mechanical, or electrical codes” (Kapsch, 1981, p.5). Building codes is a generic term that can be used to describe all of the different types of codes. **Codes for Existing Buildings** will refer to a set of codes that is designed to work with existing structures. In North Carolina this will be Chapter 34 and the Rehab Codes. **Chapter 34** references the section within North Carolina’s Building Codes that is specifically designed to work with existing buildings. A **Rehab Code**, on the other hand, is a complete document that stands on its own and within this thesis refers specifically to North Carolina’s version of the document unless otherwise noted. When referencing New Jersey’s Rehab Code, it will be identified as **Rehab Subcode** because that is the original name for the first set of codes that was written specifically for work performed on existing structures.

Rehabilitation terminology will also need to be identified to understand the degree of work required on a project once the building permit has been filed. **Rehabilitation** is “the repair,

renovation, alteration or reconstruction of any building or structure” (North Carolina, 2009, p.16). There are six categories one can file a rehabilitation project under: Repair, Renovation, Alteration, Reconstruction, Change of Use, and Addition (Connolly, 2003). It is important to be aware of what the proposed project’s use is because that helps determine which set of codes to use. **Repair** is the restoration to the building’s fabric where it has been worn, deteriorated, or broken using materials similar or identical to the original (North Carolina, 2009). This can be as simple as replacing a wood mullion that has been eaten away by termites or as complex as fixing the staircase. **Renovations** are the removal and/or replacement of existing fabric whether that is interior or exterior. It does not change the configuration of the space, and the new materials serve the same purpose as the old (North Carolina, 2009). This can include the removal of lead paint, or changing a solid wood door to one that is hollow. **Alteration** is the rearrangement of any space due to construction, including the addition or elimination of walls, partitions, doors, or windows and “any work which reduces the load bearing capacity of or which imposes additional loads on a primary structural component” (North Carolina, 2009, p.15). This kind of work calls for an architect or designer for structural purposes, and is the first category where an individual cannot perform the task on their own. **Reconstruction** is when the extent of the work does not allow the area to be occupied. A new certificate of occupancy is required, and may include repair, renovation, alteration or any combination thereof (North Carolina, 2009). This does not include painting, floor finishes, or wallpapering. Lead and Asbestos hazard abatement projects, however, are not technically qualified as reconstruction even though spaces cannot be occupied while the work is being completed. **Change of Use** is when the use of a building is changing from one to another; this can be the entire structure or just a portion (North Carolina, 2009). An **addition** increases the footprint of a building, whether this is vertical or horizontal (North Carolina, 2009). This is the most extreme category of change and requires the most caution when dealing with

codes and historic buildings. These six categories range from quick and easy fixes to yearlong projects that require the involvement of engineers, architects and designers. They determine what codes will work for updating a structure and which ones will cause issues. This terminology is important as it defines different approaches to a project.

The National Register has composed a list of seven key components that need to be identified to understand *historic significance*: location, design, setting, materials, workmanship, feeling and associations (Andrus, 1991). The **location** of the building should remain the same unless it absolutely has to be moved, in which case it should be moved to a similar location. The **design** of a building not only references the architectural components but also the scale and massing of a building. **Setting** is similar to location but it is about that which surrounds the site, whether urban, suburban or rural. **Materials** are what the building or detail is constructed of such as: wood, brick, masonry, or metal. **Workmanship** is the building traditions, such as how the brick or glass was formed to create the surfaces. **Feeling** is less tangible than the other aspects and it is how one feels when at the site from a culmination of the multiple tangible factors. Finally **association** is how it references its original use and reasons for being built (Andrus, 1991). To keep the historic significance intact, projects must comply with the building's existing elements within these seven categories and overall keeping of a sense of time and place.

This terminology will be used throughout the thesis and will provide a better understanding when dealing with building codes and historic preservation. The two dialects will merge together to create a concise analysis of how existing building codes have been applied to historic preservation projects within North Carolina.

### *The Development of Building Codes*

Tax Credits brought about an increase in projects that deal with existing structures, creating a greater need for building codes that address this issue. Building codes are a set of

regulations that are used to govern how buildings are designed and constructed with the goal of achieving the highest life safety. These guidelines currently state the minimum standards for materials, how materials and construction methods should be tested, and general public goals including access, sustainability, and indoor conditions (Winter, 2003). While the first set of codes was designed with the idea of protecting the valuable items housed within structures, they have evolved to include the idea of life safety.

Building codes have been around for years, but they were not mandatory until after the Great Chicago Fire, which occurred in 1871, burning down and leveling the central business district of Chicago due to the wood-framed construction. After this fire, the insurance companies wanted to guarantee the safety of products within warehouses, mills, and industrial structures, so they required the buildings to install fire sprinklers (Kaplan, 2003). In 1896 the National Fire Protection Agency (NFPA) was formed to standardize the installation of the sprinklers that were required by the insurance companies (Kaplan, 2003). This emphasized the importance of building regulations, bringing to light a series of events that can trigger alterations and laying the foundation for building codes that are used today.

Often building requirements are due to tragedies. One example of this is the 1911 Shirtwaist Factory fire in New York that resulted in 146 deaths, and led to the 1918 Factory Exit Codes (Kaplan, 2009; Seward, 2007). Note that this is one of the first set of codes that was designed to protect the occupants of the building instead of products and machinery. Once the Factory Exit Codes were created, cities began developing building exit codes for other types of structures, the first of which was written in 1927. This document was not just for factories but any commercial building such as apartments, offices, and retail spaces. Listed below are a series of fires that have affected the development of building codes.

**Table 1. Tragedies and their Impact on Codes**

<b>Year</b>	<b>Location</b>	<b>Death Toll</b>	<b>Change in Building Codes</b>
1942	Coconut Grove Night Club, Boston, MA	492	Overcrowding, combustibile interior finishes, inadequate egress (significant changes occurred to the code in 1948, 1952, 1957, 1963)
1977	Beverly Hills Supper Club, Souhgate KY	165	requirements for automatic sprinklers and fire alarms in new and existing structures for assembly occupancy for more than 300
1980	Stauffer's Motel, Westchester County NY	26	toxicity standards introduced
1980	MGM Grand Hotel and Casino. Las Vegas NV	84	lethal gases in fires creating more requirements for detection and sprinklers in hotel occupancy
2001	World Trade Center, New York NY	2752	420ft or higher required 3 hour structural fire resistance rating (changing from 2 hour for fire fighter safety)
2003	Station Nightclub, West Warwick RI	100	increased requirements for sprinklers in all clubs with live entertainment and more than 300 occupants

Codes also evolved to improve living standards. New York passed their tenement laws of 1867 and 1910 to help the growing immigrant population receive more acceptable housing conditions. New York's laws became a part of the 1905 National Building Code (Kaplan, 2009). These are some of the first codes that did not deal with fire safety, but life safety. By putting these requirements into the national code book, the laws soon were adopted throughout the country, taking into consideration the welfare of the citizens.

Another factor that can influence building codes is the expansion of cities and suburban areas within a community. This can be seen after World War II, when the nation's unmanageable growth sparked new regulatory changes. According to Kaplan (2003), during this time there was an "explosive growth of western and southern cities, [leaving] behind vacant and decaying cores in older cities in the Northeast and Midwest"(p. 6). Codes were needed to deal with the new construction while still responding to those buildings that were left behind. Municipalities



adjusted to this expansion by creating zoning regulations, hoping this would help control the growth of new construction by managing where certain types of structures could be built. What this did not address was the abandonment of buildings within city limits. These buildings sparked urban renewal projects, which were designed to bring the community back into the city. The projects created the need for new regulations that focused on minimum housing standards, causing the demolition of multiple blocks of historic buildings that had been vacated during the suburban expansion (Kaplan, 2003). During this time cities were seen as unsafe and they gained an undesirable reputation. The idea was that by updating and revitalizing the city, people would be attracted to the area again.

#### *Creating and Managing Codes*

While codes were being developed there were three different code councils, formed between 1915 and 1941, managing different areas of the country. Each council's job was to create model codes that would list the minimum standards for life safety. The Northeast and Midwest had the Building Official and Code Administrators (BOCA), the West followed the International Conference of Building Officials (ICBO), and the South used the Southern Building Code Congress International (SBCCI) (Green & Watson, 2005). Having three different sets of codes caused challenges for architects and designers who wanted to expand their company nationally. This issue was solved in 1994 when the International Code Council (ICC) was formed. The committee took the input of multiple professionals from each district, combining all three codes. Their mission was to create effective codes while "not unduly increasing construction costs; neither limiting or favoring the use of new materials, products or methods; and not reducing the level of safety provided to the public"(Kaplan, 2009, p.13). Once one set of codes was established, it became easier for companies to expand nationwide because all states followed

these guidelines, though they may have slightly altered them based on the needs of the community.

Building codes are constantly being updated with amendments, and a new code book comes out every three years. Amendments are usually triggered by tragedies that have occurred, living circumstances that have been altered, or the changing needs of the building occupants. New code books take into consideration the advancements in technology, new materials and products that have been developed, and new construction types (Hattis, 1981). Unfortunately this means it outdates construction methods, creates archaic materials, and does not take into consideration buildings that have already been built. Only a small percentage of historic buildings, mainly house museums and buildings whose use remains the same, are not affected by the ever-changing nature of building codes. According to Kaplan (2003), “The Challenge lay instead with the unpredictability of code application to the thousands of buildings that were not readily recognized for their historic significance and had existing or proposed occupancies associated with daily work and living”(p. 6).

#### *The Creation of Codes for Existing Buildings*

Historic buildings have value within any community, which is why there is a need for building codes to recognize the importance of existing buildings. The development of these codes began in the 1960s and 1970s due to the influence of Housing and Urban Development (HUD), whose programs and documents generally promoted rehabilitation over demolition (Kaplan, 2003). HUD’s Minimum Design Standards for Rehabilitation Properties (1973) brought restoration to light, inspiring the three model code organizations to start incorporating guidelines for existing buildings. HUD continued by publishing the first eight volumes of the Rehabilitation Guidelines in 1980. Rehabilitation hit an ultimate high during this time period because of new tax incentives and the communities’ desire to counteract the failed effects of post-war urban renewal

and demolition programs (Kaplan, 2009). Over the next few years, building codes for existing buildings would evolve, providing a great opportunity for rehabilitation in our older cities.

Before codes were written and generated specifically for existing buildings, working on older structures would at least double the time needed, changing a twelve-month project into a two- or three-year project (Kapsch, 1981). Due to the extended time requirements and the cost of bringing a building up to code, architects either avoided working on these types of projects within certain neighborhoods or inspectors ignored the flaws when inspecting an existing building. Both of these issues caused harm to the surrounding population, because it did not ensure the safety of the building. As HUD brought these issues to light, people began to see the need for a separate set of documents that would govern how existing buildings could be reused and still remain safe.

Since then, multiple organizations have created and adapted their codes to meet the needs of existing buildings. The ICBO created two sets of documents, one in 1985 known as the Uniform Code for Building Conservation, and one in 2000 called the Guidelines for the Rehabilitation of Existing Structures. These codes required the building be brought up to existing code unless the new occupancy was less hazardous than the original. The SBCCI created its version in 1988, known as the Standard Existing Building Codes. HUD once again led the pack in rehabilitation, creating in 1988 A National Survey of Rehabilitation Enforcement Practices. This document took a survey from around the country to note positive and negative aspects of each code. This common idea is still being referenced by multiple organizations, including the National Fire Protection Association (NFPA) which introduced NFPA 914: Code for Fire Protection of Historic Structures (2000). These codes will assist “designated Historic Buildings, older Buildings with architectural merit, and main street structures with issues related to mixed-use occupancies and limited square footage”(Kaplan, 2003, p. 8).

Beyond model code organizations and HUD, the issue soon became recognized individually by the states. The first state to embrace provisions for rehabilitation was Massachusetts in 1979 (Kaplan, 2009). The hardest issue encountered with rehabilitation and codes was when a building changed its occupancy and therefore its hazards. Massachusetts took this into consideration and created a hazard ranking system to assist with the change of occupancy. The next state to join the movement was California, as the state was preparing for its bicentennial by rehabilitating important historic buildings. In undertaking these renovations, they realized they were having to destroy the architectural character of the building to meet codes (T. Winter, 2003). In 1975 the state adopted the Health and Safety Code Section 18950, or The State Historic Building Code. This addition became state law in 1998, eliminating the need for local adoption and therefore providing the whole state with the opportunity to use the code (Kaplan, 2003). Massachusetts and California are just two examples where the adoption of sections within building codes that were designed to help with the rehabilitation of existing buildings provided successful outcomes when joined with the state's building code.

#### *The Creation of the New Jersey Rehab Code*

In 1998 New Jersey made a huge leap by creating their Rehabilitation Subcode, becoming the first state to adopt an entirely separate document – meaning it was not an addition or an amendment to a chapter of their state's building code. The Rehabilitation Subcode was designed to deal with existing buildings in an effort to provide a better approach towards adaptive reuse. These codes were developed in cooperation with the fire department and the building code officials to explore the options for restoring and reusing existing buildings. This group of individuals did not believe that a building was only safe if it met all the current fire and safety codes, they believed that a bargaining system could be used to meet the safety needs of the community. For example, in the Rehab Code a building does not have to widen their existing

staircase if they supply more fire sprinklers per square foot. The Rehab Code would allow older buildings to be renovated and meet life safety codes rather than being abandoned. Therefore these codes allowed for a building to better fit the needs of the community without necessarily bringing them up to the current codes (Pianca, 2002).

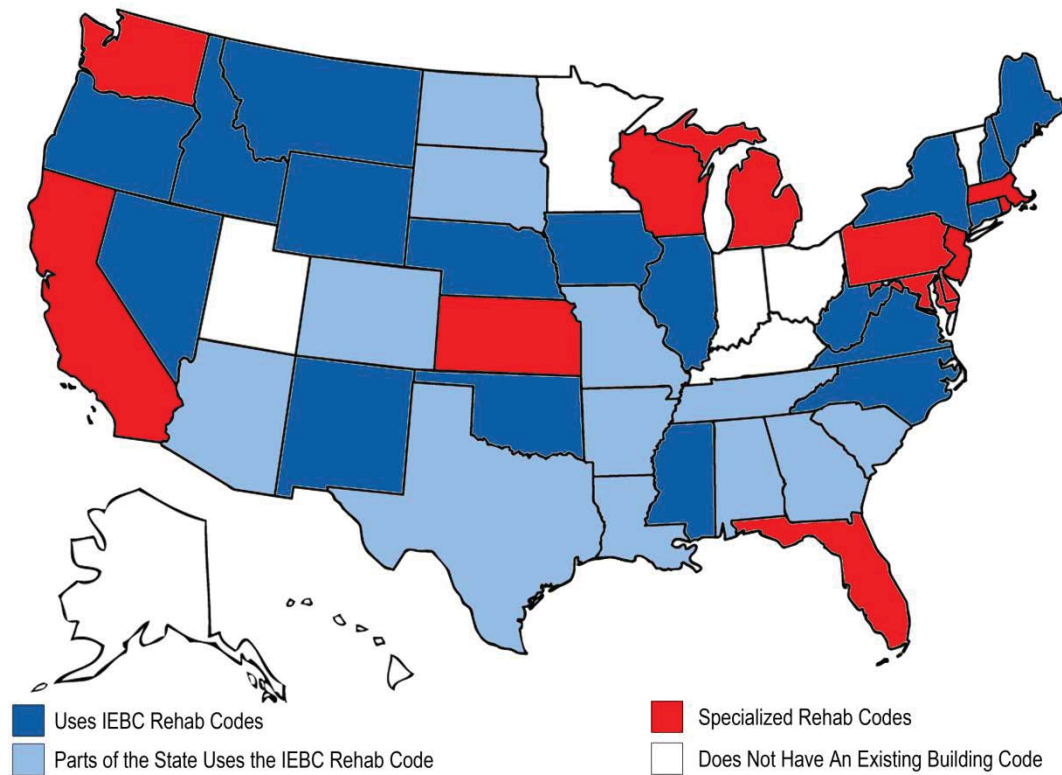
Basically Rehab Codes were developed on the idea of existing structures being used for a different purpose with the intention of bettering the community. This type of code was needed specifically because of the urban crisis in New Jersey, which had hundreds of abandoned buildings and very little space to expand. These codes have helped New Jersey rehabilitate their existing buildings, which greatly influenced their downtowns because it is one of the older states. One important benefit these codes provide is the ability to reduce the total cost of construction by at least twenty-five percent (Connolly, 2003). These codes have made rehabilitation more accessible and more affordable, making developers want to work with existing sites. Once these codes were established, rehabilitation spiked within New Jersey, as Connolly discovered in his 2003 study of 16 selected communities. Within the first year of the code these cities showed a 40.6% increase of rehabilitation while the following year these same cities showed a 62.5% increase (Connolly, 2003). The increase in rehabilitation shows that more development was able to take place especially in the highly populated areas where buildings had been abandoned. This provided New Jersey with the opportunity to bring people back into the city, and make their buildings livable again providing opportunities to boost their economy.

#### *Spread of Rehabilitation Codes*

Based off of the success of New Jersey's Rehab Codes, Wisconsin decided to create its own version, called the Smart Growth Codes in 1999, using New Jersey's as a reference. The next state to join the movement was Maryland, which took New Jersey's and Wisconsin's existing codes and adapted them for their state, creating their Smart Codes in 2000. Wichita,

Kansas formed their codes in 2001, believing that the benefits can work not only at a state level, but a city level as well. The Grow Smart Codes of Rhode Island were formed in 2002, along with the Rehab Codes of North Carolina. These states wanted to participate in the Rehab Codes since the benefits were so compelling.

As more and more states began to develop their own set of rehab codes, the International Code Council decided to establish a national rehabilitation code. They took the positive aspects of New Jersey, Maryland, and Rhode Island's rehab codes to form their own set (Mattera, 2006). The International Code Council released the International Existing Building Codes in 2003. Once there was a pre-defined set of codes that one could follow, the following states adopted them: Connecticut, Florida, Louisiana, Maine, Michigan, Montana, Nevada, New Mexico, Ohio, Oklahoma, Pennsylvania, Virginia, and West Virginia. Besides these states, certain cities within Alabama, Colorado, Illinois, Iowa, Maryland, Mississippi, Missouri, Nebraska, South Carolina, South Dakota, Tennessee, Texas, and Washington adopted the Rehab Codes as well. Due to the International Existing Building Codes, Rehab Codes spread to more than 30 states by 2006.



**Figure 2. Existing Building Codes Spread Across the United States as of October 2013 - data retrieved from individual state building code council websites and cross referenced with the International Building Code Council (IBCC) adoption by state (IBCC, 2013).**

These codes have had great success when used on existing structures, but they have been designed to work just as well with structures designated as *historic*. “The Rehabilitation guidelines [and Chapter 34] have two essential purposes: to assist those who want to modify their existing building codes and building regulatory process to facilitate rehabilitation in their cities; and to assist rehabbers, architects and engineers who have specific rehabilitation/ building code problems” (Kapsch, 1981). These codes were given even greater success when historic buildings could maintain their historical significance through the rehabilitation process, and therefore still use state and federal tax credits. These projects allow for our historic buildings to take on a new occupancy and therefore remain viable within the community.

Although there are national rehabilitation codes that can be used, existing building codes are still being adapted and reworked on a national level. As with any building codes, they tend to vary from state to state, because they need to meet the requirements that are specific for a region, for example California and its earthquakes, the North with their its snow, the East Coast with its hurricanes, and Illinois with its wind. These changes can be regionally, geographically, or state enforced depending on the different effects of Mother Nature. These codes not only adapt for natural causes, but also for different environmental regulations a state may have. It is more work to adapt the codes to meet the needs of each state, but in the long run it becomes beneficial by making the buildings as safe as possible, considering multiple factors and not just those dictated by the International Code Council.

Before there were existing building codes, rehabilitation projects relied upon the guidance of the 25/50 rule. These rules were based on a formula that was used to decide whether or not the rehabilitation project was seen as acceptable (Syal et al., 2001). If the percentage value of the proposed work was below 25 then the building inspectors would determine whether or not the building had to meet current code. If the percentage was between 25 and 50, the entire project needed to meet the current building codes. These rules allowed for very little opportunity to rehabilitate a building without having to forgo more money, time, and energy, causing preservation to be more of an annoyance than anything else.

#### *Chapter 34 and its Effect on Existing Structures*

Chapter 34 is a subset of the International Building Code, it was created by the Building Officials and Code Administrators International (BOCA) and was the first attempt by a national group to deal with existing structures. These codes were first introduced in the National Building Code in the 1984 edition and have since been reworked and adapted to meet the needs of the public and solve problems that have been discovered. These codes are still used today on a wide



range of projects and are available within the ICC (Seward, 2007). These codes are different from others for they work on a scoring system which allows some areas to fall short within the safety requirements, as long as others make up for it; allowing for buildings to meet the safety needs by an average score, analyzing the structure as a whole, instead of judging each issue individually. The scoring system is very important for, unlike the rehab codes, there is a set score the building needs to reach and therefore the judgment is not entirely up to the building inspector. The scoring system helps historic structures, which are limited by a number of outdated features, such as narrow egress paths and lack of fire separation between floors. Unfortunately these codes were not used very often for they rely on the judgment of the inspector to score each system, and can be influenced by personal opinions.

Chapter 34 has some issues when being applied to an existing structure, but it is useful as it allows for a controlled departure from meeting the requirements of all codes while still maintaining the safety of the occupants. The codes modifications can be useful when dealing with historic buildings whose staircases are too narrow or exits are too minimal. Some of the disadvantages to using this particular set of code would be working with larger projects, especially when they are more than one story (“Occupying Existing Buildings,” 2012). The height of a building can become a real issue, for most historic buildings tend to be more than one story. This code is most effective when working with a one-story structure but can be used for multiple stories as long as the designer/architect is aware that complications might arise.

Chapter 34 divides rehabilitation work into four categories: repair, alteration, addition, and change of occupancy. This is unlike the rehab codes which splits alteration into renovation and reconstruction, meaning that an alteration can vary within project descriptions from removing and adding walls to replacing finishes (Syal et al., 2001). By only containing alterations, the

project descriptions will become more valuable so that one can understand the degree of work within the project.

### *Challenges and Benefits of the Rehab Code*

Each set of codes has its own positives and negatives when working with a project and can make the decision making process either really easy, because the task is simple, or quite difficult when the rehabilitation consists of multiple changes and processes. Once the permit has been filed and the code identified, there is no changing or maneuvering between both codes; the decision is final. In North Carolina's Rehab Code, which was adopted in 2002, there are six possible categories under which a rehabilitation project can be filed: repair, alteration, renovation, reconstruction, addition, and change of occupancy. These six categories define the amount of work to be done on a particular building while it is under construction and determines what code requirements need to be met. North Carolina's rehabilitation code takes into consideration that when this building was constructed it met all of the codes required at the time; the main benefit of the NC Rehab Code is that it allows for an easier change in occupancy ("Occupying Existing Buildings," 2012). There are some disadvantages to the North Carolina Rehab Code, such as the inability to remove any safety systems that are already in place, including but not limited to sprinklers, standpipes, and fire alarms ("Occupying Existing Buildings," 2012). Retaining such existing features can be a real issue when trying to bring a building back to its original condition for historic recognition because the existing safety system may compromise the historic character of primary spaces. The Rehab Code could not be used if any of these systems needed to be removed. Another issue that occurs when using the North Carolina Rehab Code would be when the work is classified as reconstruction and exceeds the allowable square footage. The building then has to meet both the current code and the Rehab Codes, doubling the work ("Occupying Existing Buildings," 2012). Thus quantifying the square footage of proposed reconstruction needs

to be addressed before beginning construction. Therefore, if this issue arises it is because plans have been changed after filing for a permit.

Although the Rehab Code has weaknesses, it is truly important to remember how the code can benefit projects. When it comes to materials and methods, the Rehab Code allows for replicas to be used in historic structures so that it can maintain its historical significance (Connolly, 2003). These allowances are an important factor, as they can help keep the building safe while preserving its historic fabric. A larger issue is egress, which applies to the width of staircases or corridors, travel distance to an exit, as well as exit signs. The Rehab Code allows flexibility with the location of the signs, providing the opportunity to keep historic elements intact, to be as discreet as possible, and prevent harm to surrounding materials. Finally, when it comes to the interior finishes, the Rehab Code allows them to remain even if they are violating modern requirements, as long as historical significance can be proven. While historical finishes may not meet the regulations set forth by the fire department, these codes allows the finishes to remain as long as extra precaution is taken elsewhere.

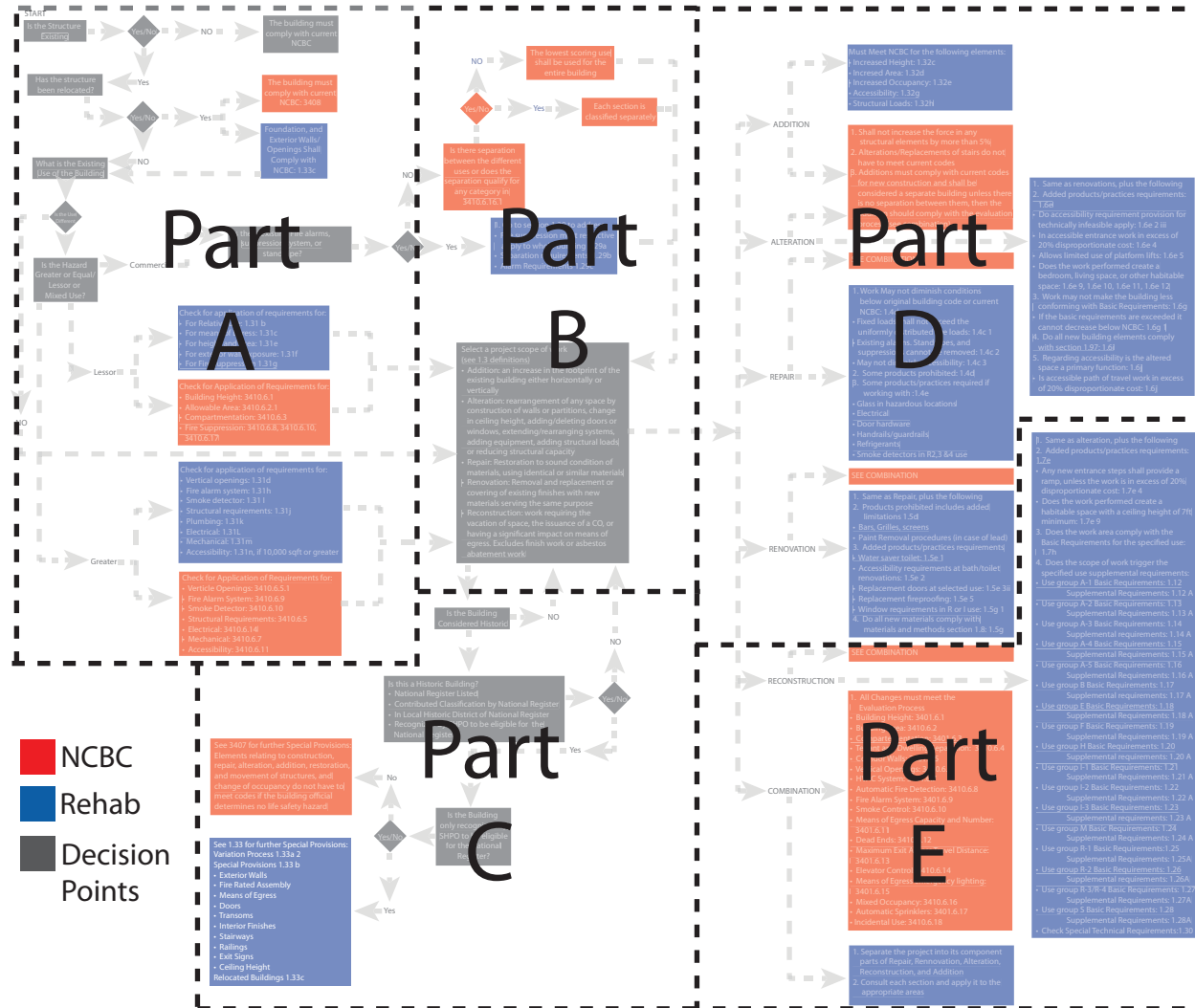


Figure 3. Decision Matrix - key Diagram. Looking at the basic differences between the Rehab Code and Chapter 34 when applied to projects

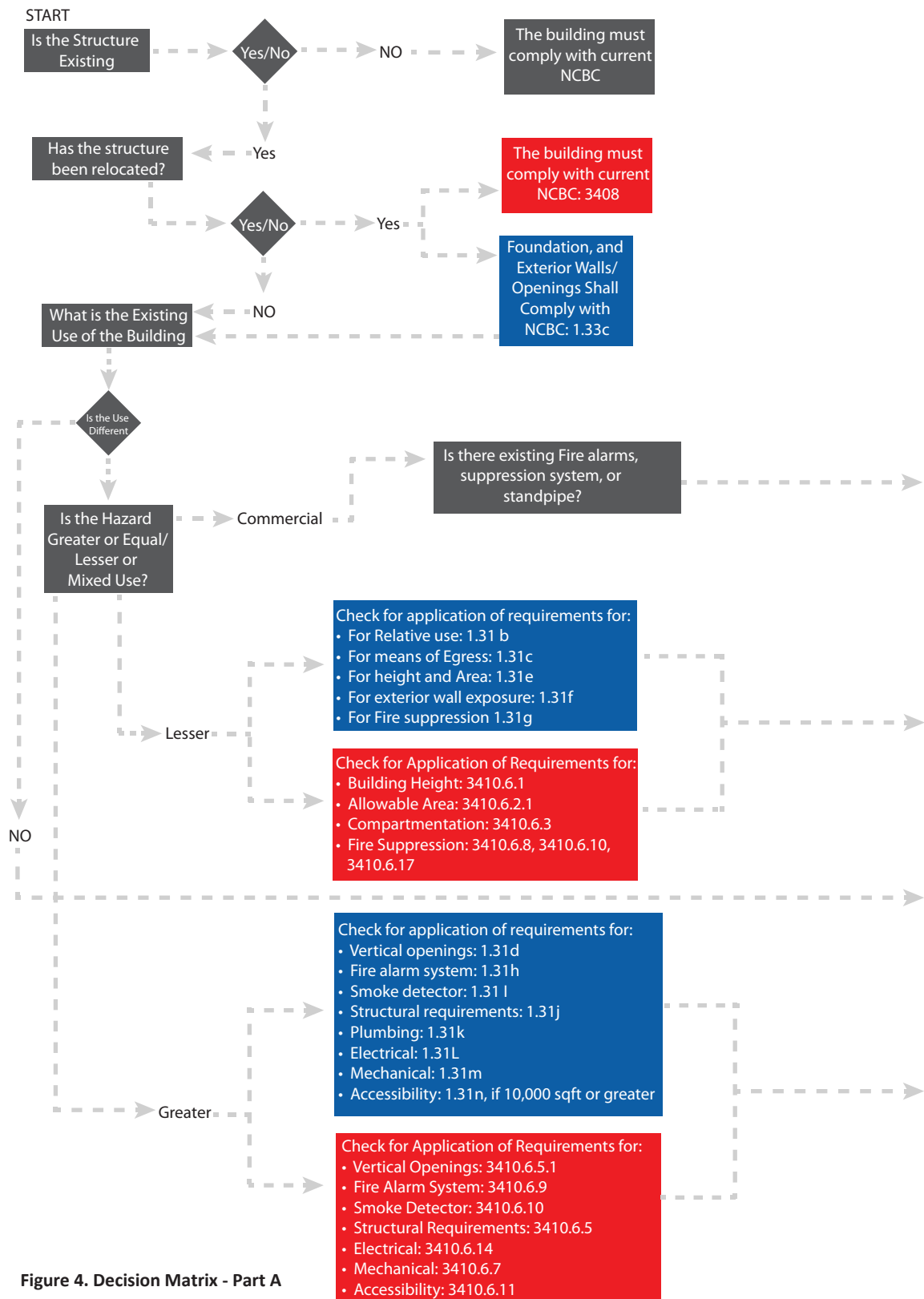


Figure 4. Decision Matrix - Part A

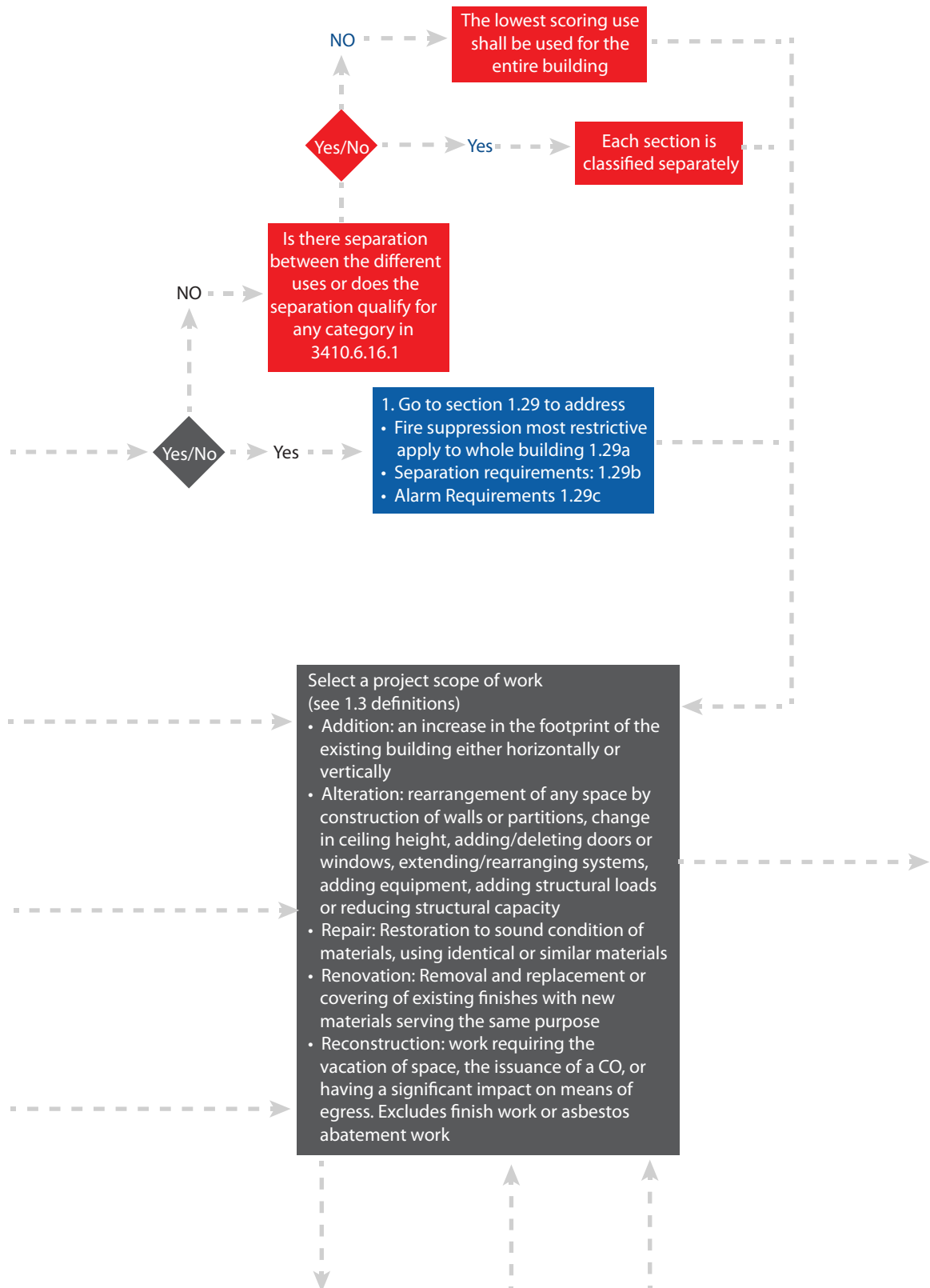
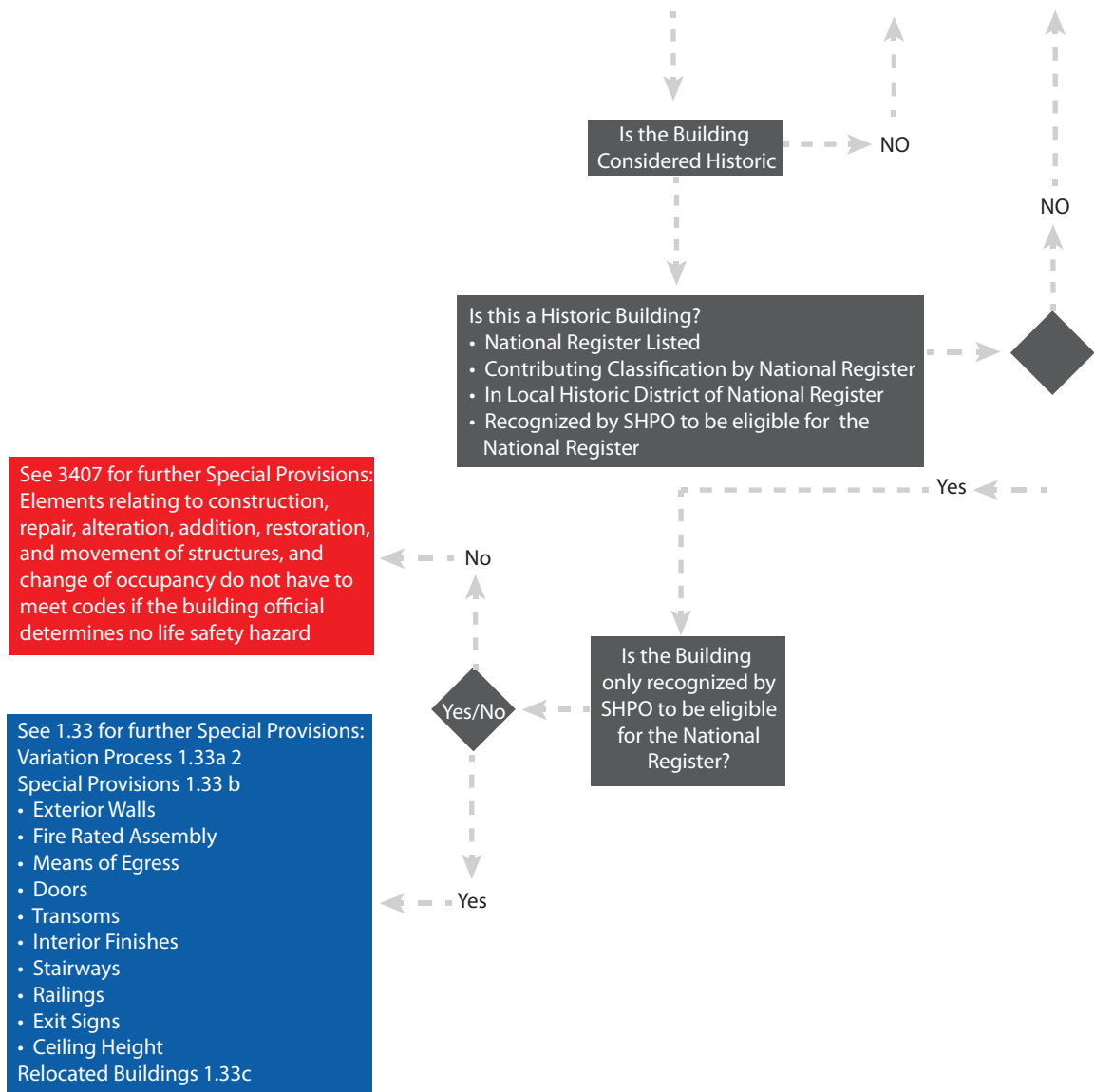


Figure 5. Decision Matrix - Part B



**Figure 6. Decision Matrix - Part C**

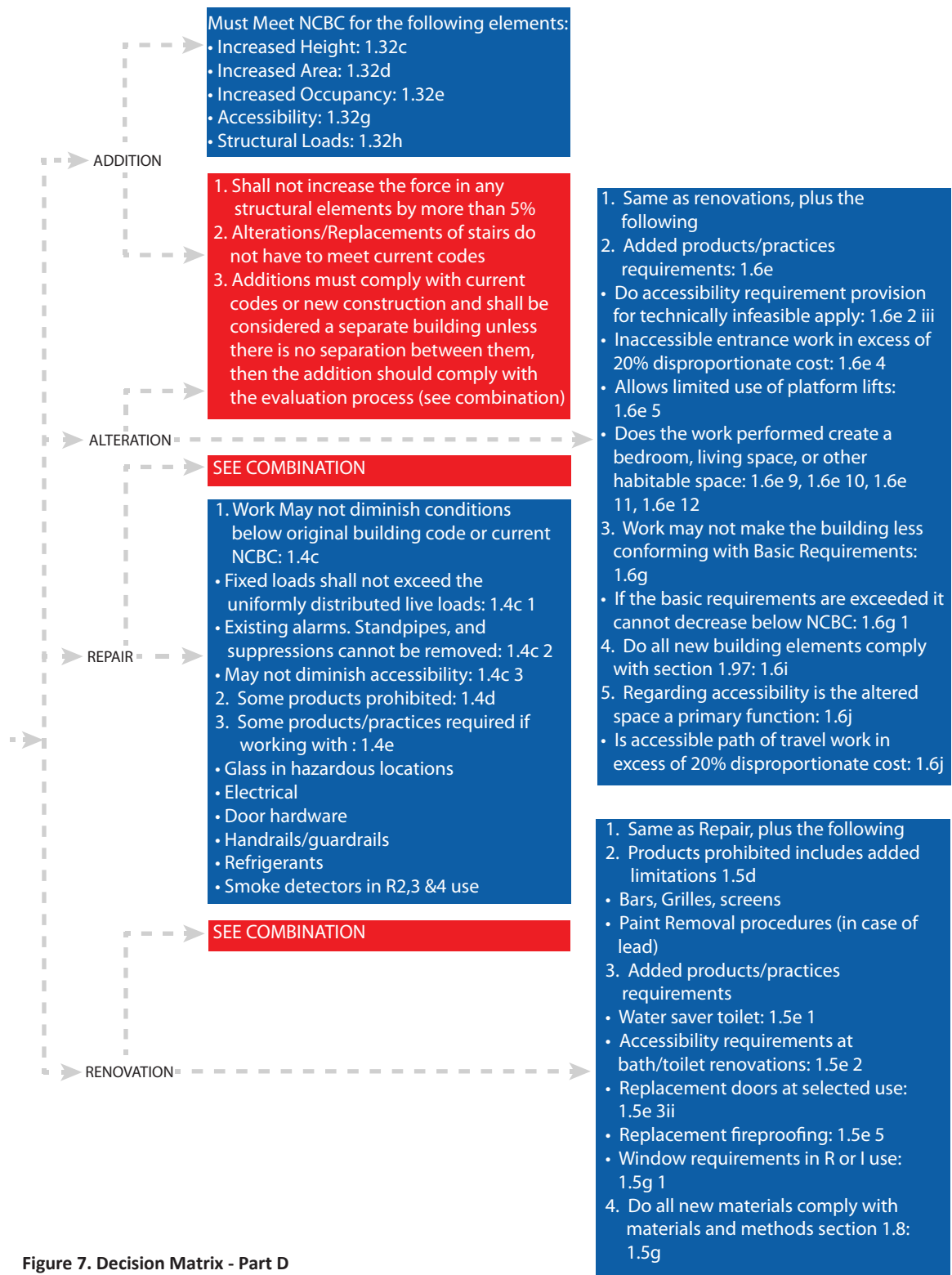


Figure 7. Decision Matrix - Part D



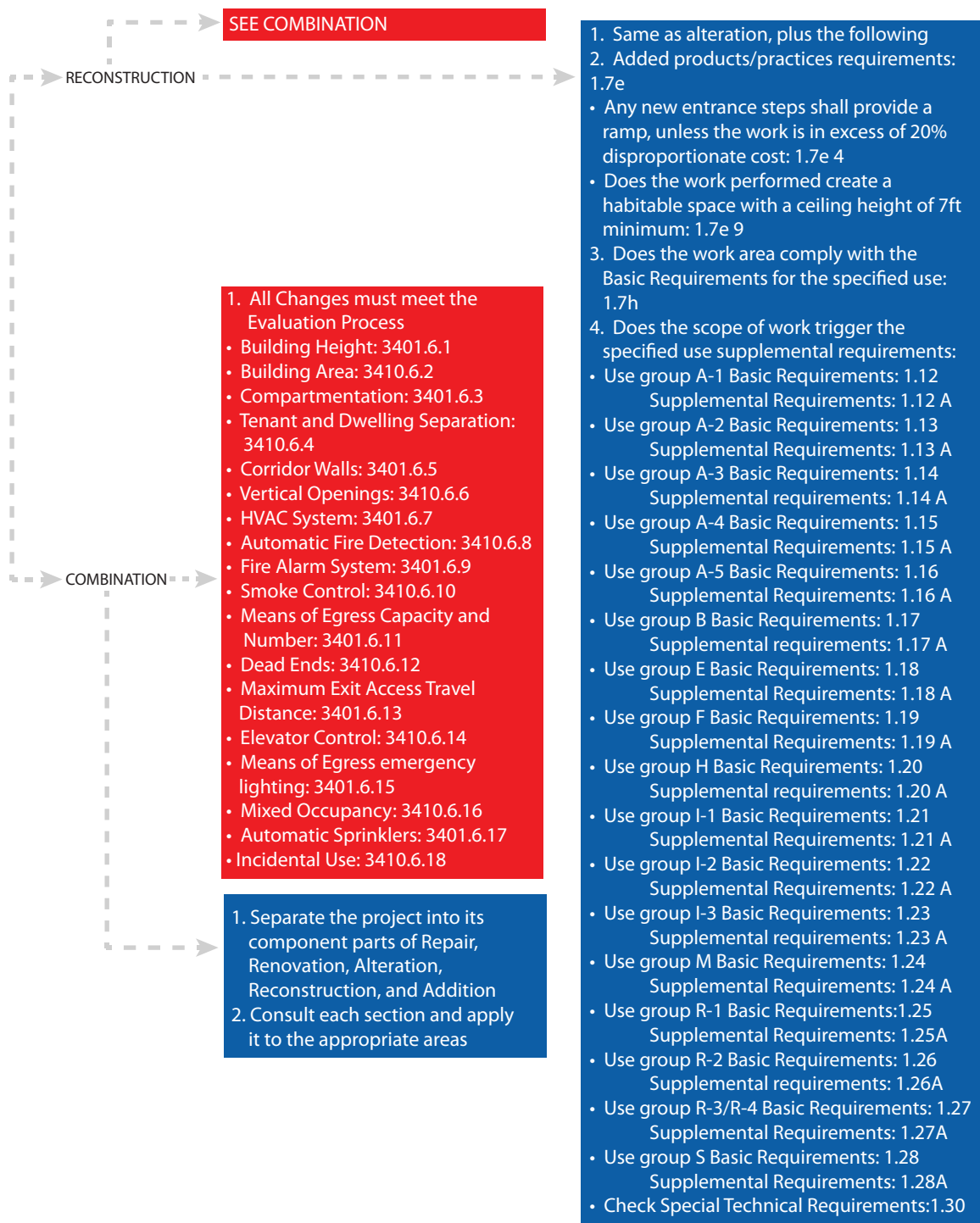


Figure 8. Decision Matrix - Part E

### *Current Code Consolidation Proposals*

Currently in North Carolina there is an ad-hoc code committee working on combining the codes to create one document. Although the committee was formed for several reasons; however, the main reason was that the International Building Code Council (IBCC) is considering removing Chapter 34 from its regulations (Register, 2013b). The IBCC, however, created the International Existing Building Code Book (IEBC) in 2003. The IEBC is arranged similarly to the Rehab Code, in that it separates projects based on the level of work that needs to be completed. The difference is that within these different levels, the information is organized by subject and not by occupancy, similar to Chapter 34 (Register, 2013b). All three of these code books in some way or another include the special classifications of work, since not all projects are the same. Overall this book takes the classification from the Rehab Code and the organization from Chapter 34, meshing the two code books together. This book was intended to be more user-friendly, similar to the Rehab Code.

Since North Carolina has not adopted the IEBC yet, this action would mean the state would only be left with the Rehab Code. The committee hopes to create a more versatile set of guidelines available for rehab projects (Register, 2013b). If approved, their current working proposal would be adopted as the North Carolina International Existing Building code. In the end this would leave North Carolina with only one code book when working on existing structures, streamlining the preliminary design because there would be no more debate over which code meets the needs of the project and no more time delays by originally choosing the wrong code and then having to go back and alter the design. While it would be only one code book, it would offer multiple options, allowing someone to select different aspects from the Rehab Code, Chapter 34, and the International Existing Building Code and apply them to one project (Register, 2013b). The final code book would have three methods of compliance: a Prescriptive Method, a

Compliance Method, and a Performance Compliance Methods (Register, 2013a). This choice offers designers and architects multiple ways to approach a project.

### *Significance*

This thesis looks at the application of existing building codes in North Carolina, however the same method of analysis could be applied to any particular geographic region. This can be achieved because Historic Tax Credit Projects have to meet the Secretary of Interior Standards for the Treatment of Historic Properties, which is a nationwide set of guidelines that may be applied to all historic properties. Although the codes may vary from state to state the end results are the same throughout the nation. A nationwide understanding of codes for existing buildings is important for they can prove to be an economic benefit to a community by saving designers and architects money when rehabilitating a structure, as well as offering the opportunity for new business to move into neglected buildings for a low cost. This is achieved by working with existing structural elements and extending the life of the historic built environment.

This study is important to the discipline of historic preservation because it analyzes select factors affecting the rehabilitation of a building and, in turn, the revitalization of a neighborhood. It reveals patterns within the application of existing building codes, and identifies differences in code approaches to preserving the historical significance of a structure. The data gathered and analyzed help provide a better understanding for how to work with existing and historic structures, therefore allowing an easier approach to the rehabilitation process.

This analysis is valuable information for the discipline of interior design/architecture, because Rehab Codes and Chapter 34 offer different approaches for interior architects, architects, and engineers to consider how these spaces can be adjusted to meet the life safety codes. Overall the data gathered and analyzed in this thesis reveals patterns in code choices for historic buildings

that may illuminate and expedite the decision making process for the preservation and rehabilitation of more historic buildings in the future.

## **CHAPTER III**

### **METHODOLOGY**

#### *Purpose of Study*

Through this analysis, the researcher studied the application of existing building codes to historic buildings when the intent was to maintain their historical significance as they were rehabilitated and adapted. To understand how the Rehab Code and Chapter 34 are being applied to historic buildings, the analysis is based on a purposeful sample of Historic Preservation Tax Credit Projects in North Carolina over a ten year period. This thesis not only looked at what codes are being used, but identified a series of variables that can help determine why a particular code was applied to a project.

In this thesis the researcher employed a series of different methods to gather data to answer the main question: What building code is applied most often within historic tax credit projects?

Additional questions include:

- Are there any patterns in code use related to the following variables:
  - The construction materials
  - The buildings use before and after the rehabilitation
  - the architects, engineers, and designers working on the project
  - the scale/size of the project
  - the cost of the project
- Is there a relationship between the applied codes when dealing with industrial projects and their ability to apply for the NC Mill Bill tax credits?

- How do these results compare to the suggestions from the North Carolina ad-hoc code committee?

### *Research Design*

Within this study there are a series of different variables that were considered. The independent variables include: the Rehab Code, Chapter 34, the architectural firm, scale of the project, specific occupancy, and the size of the local municipality. These variables will then be applied to the dependant variable, which is maintaining and valuing the historical significance of the building. The dependent variables are important on their own, but when applied to historical significance they can prove how valuable they are within the preservation field. Finally, all of this was studied within the control variable of tax credit projects. These variables create an opportunity to triangulate the data gathered in order to provide a better understanding of the application of each code.

### *Narrowing the Field*

In this investigation the researcher selected a group of buildings that would demonstrate how historic significance was kept intact despite alterations to the structures. Due to the time constraints the data analysis was narrowed to projects that would provide the most valuable results. Gathering building permits was a time consuming process creating a need for narrowing the list of properties to be studied. Building permits are not located in one database but stored by each county and/or city requiring multiple visits to the planning departments for each county and/or city to obtain all the required information for this study to be conducted. To most effectively analyze the use of Chapter 34 and the Rehab Code throughout the state of North Carolina, counties were selected based on their success with rehabilitation projects.

Specifically, Tax Credit Projects were analyzed because the work conducted on these buildings must meet the Secretary of the Interior's Standards for Rehabilitation. This means that

once the work has been completed both the interior and exterior must maintain the important historic characteristics of the structure. For this particular study non-tax credit rehabilitation projects that use Chapter 34 and the Rehab Codes were not included because they do not have to prove historical significance was maintained.

North Carolina's State Historic Preservation Office (NCSHPO) provided a list of the state's one-hundred counties, along with the number of National Register listed properties, the number of tax credit projects since 1998 that have been completed, and the amount each county has invested in historic preservation as of December 31, 2011. From this list, counties that had completed over 100 projects utilizing preservation tax credit since 1998 were selected, narrowing the focus to four counties: Wake (272), Mecklenburg (218), Durham (183), and Forsyth (101). The number of completed tax credit projects in these counties ensured that the county was familiar with the Historic Tax Credits and would provide a large enough pool to determine patterns within rehabilitation work. The researcher learned that the four chosen counties: Mecklenburg, Forsyth, Durham, and Wake; were selected to host the pilot program for the North Carolina Rehab Code along with Guilford County. These five counties began using the Rehab Code in 2002 and, because of its success, it became a permanent option in 2003.

After selecting the four counties, a list was retrieved from NCSHPO of all properties in the selected counties that have applied for Historic Preservation Tax Credits. The field was further narrowed by removing all projects that applied for tax credits before 2002, when the Rehab Code was introduced to North Carolina. This left 54 projects in Wake, 30 in Mecklenburg, 59 in Durham, and 36 in Forsyth, totaling 179 projects, which provided a wide range of building types to be analyzed.

Of the 179 projects, 45 used the North Carolina Residential Code required by the North Carolina Building Code for all one- and two- family dwellings and townhomes. The researcher

eliminated them from the analysis, because no other building codes could be applied to these rehabilitation projects. The remaining projects included 47 in Wake, 26 in Mecklenburg, 44 in Durham, and 17 in Forsyth, equaling 134 projects. This became the final list of buildings analyzed in this thesis.

### *Methods*

The research focused on the affects of the Rehab Code in comparison to Chapter 34 by studying their use between 2002, when the rehab code was adopted by North Carolina, and 2012, when the research for this thesis began. This ten year time period provided ample opportunity to chart how these codes have been used in Forsyth, Mecklenburg, Durham, and Wake County, as well as how these codes correlate to the construction materials of the building, the use before and after the rehabilitation, the architects, and building inspectors. The ten-year time span helped to provide an accurate analysis of how the Rehab Code and Chapter 34 have been applied to tax credit projects. For the development of this thesis a series of methods were used to answer the main question. These methods included interpretive-historical information written about the codes and correlation research to understand how the information related to one another.

#### *Interpretive-Historical Information*

The gathering of preliminary information about existing building codes was conducted through a review of literature. This established a foundational understanding that included the history, mechanisms for application, and benefits to applying Chapter 34 and the Rehab Code to projects—allowing for the data to be triangulated and analyzed, weaving together a coherent account of how these codes came to be, why they are important, and how they will continue to impact historic preservation. The interpretive-historical information helped to validate the purpose of this research, along with supporting why codes for existing buildings are valuable for our communities.



For this process contextual and inferential evidence was used to support the data that was found. Contextual evidence uses a combination of the built environments along with the objects situated within time. The contextual evidence included: building permits that cite what code was used on the building, tax credit applications which contained a description of the rehabilitation along with a certification of completed work, and the building itself. Inferential evidence is the comparison of related data within proximity of time, interpretation, and logical deduction that connects two pieces of evidence that might not have been connected otherwise. Within the analysis, the researcher linked the use of the Rehab Code and Chapter 34 to the construction of a building, the use before and after the rehabilitation, historic tax credit projects, architects, and building inspectors.

#### *Creating a Decision Matrix*

The data collected from the Interpretive-Historical Information provided an understanding of how the different codes are applied to projects. The opportunity to diagram the basic information of both codes revealed some key factors that differentiated them from one another. Some of these factors include whether or not the use of the building is changing, if there are existing fire suppression systems, and if the building is considered historic. The original use of the building refers to its previous occupancy classification. If this classification is being altered, for example residential to mercantile, then other steps need to be taken. Fire suppression systems include but are not limited to fire sprinklers, fire alarms, or a standpipe. If these elements are already part of the building they need to be taken into account. If they are not an element of the existing building, they do affect the final code decision. If a building is considered historic, special provisions are offered by both codes allowing for maintaining the structure's safety while preserving its historical significance. Overall this matrix provides a general understanding of

which building code should be applied to a particular project, but other elements do need to play a role in the decision-making process.

### *Correlational Research*

Correlational research uses documentation and analysis of naturally occurring patterns to help clarify the relationship between two or more variables (Groat & Wang, 2002). To do this, charts were created that noted the city and county in which the project was located, what code was being used on the project, the estimated cost, the use of the project before and after the rehabilitation, the square footage of the project, the building's materials, as well as the year it was built, the architect or engineer, whether it is located in an urban or rural setting, and finally if it was inspected by a city or county inspector. These topics were selected because they influence what code is used on a project. This helped to clarify the relationship between Chapter 34 and the Rehab Code and how they are being used within select counties.

Four routes were taken to gather the information needed for this chart. The first step was searching through NCSHPO files, which provided the architect, square footage, the year the building was built, and the construction materials used. However these files only went back to 2007 and did not contain building code information. Next, building permits for each project were located in the counties' planning departments, which noted what code was used, what architect worked on the project, square footage, and the use of the building. There, a database was used to locate the permit using the addresses provided, since the building permit numbers were unknown. This search process was successful with all counties but Durham, since most of Durham's files are not in the computer's database. To retrieve the information for Durham County, the researcher emailed all architects that were listed from the original search of NCSHPO files. These architects helped to identify codes and/or architects of the projects listed. It is important to note that because Chapter 34 is a subsection of the North Carolina Building Code, building permits did not have to

note whether they referenced this section or not. Therefore within this study the building codes will only differentiate between the Rehab Code and the North Carolina Building Code. The final step was using the specified county's GIS systems, which can be accessed online and provide access to the tax catalogues which noted the current use of each building, the year the building was constructed, and the materials used during the construction of each property. Once this data was gathered and processed through correlational research, the strength and weaknesses of the relationship within the variables were described. For the statistics to be read clearly, a series of charts and graphs were compiled to help determine whether or not there is a positive or negative relationship between the different variables and the use of the rehab codes.

### *Interviews*

After the data was analyzed, interviews were conducted with building code inspectors and architects to discuss the results revealed by the analysis. These interviews were on an as-needed basis with the intention of providing a better understanding of why particular building codes were applied to a certain type of project. The data gathered through correlational research determined which people were chosen for these interviews in order to compare particular patterns that emerged with the use of the Rehab Code and Chapter 34. The interviews provided a qualitative assessment of the quantitative data. They were conducted through a series of emails and phone conversations and each individual was asked the same series of questions.

## CHAPTER VI

### ANALYSIS

In order to learn which codes are being chosen for tax credit projects and why, data was gathered and triangulated to reveal hidden patterns. The gathered information does reveal that the North Carolina Building Code is chosen more often when working with historic preservation tax credit projects. This data supports the idea that a building's construction type, use before and after the rehabilitation, architect, scale, and cost does indeed affect the code selected for a project. Patterns of when the Rehab Code and the NCBC was applied to tax credit projects were revealed in this analysis.

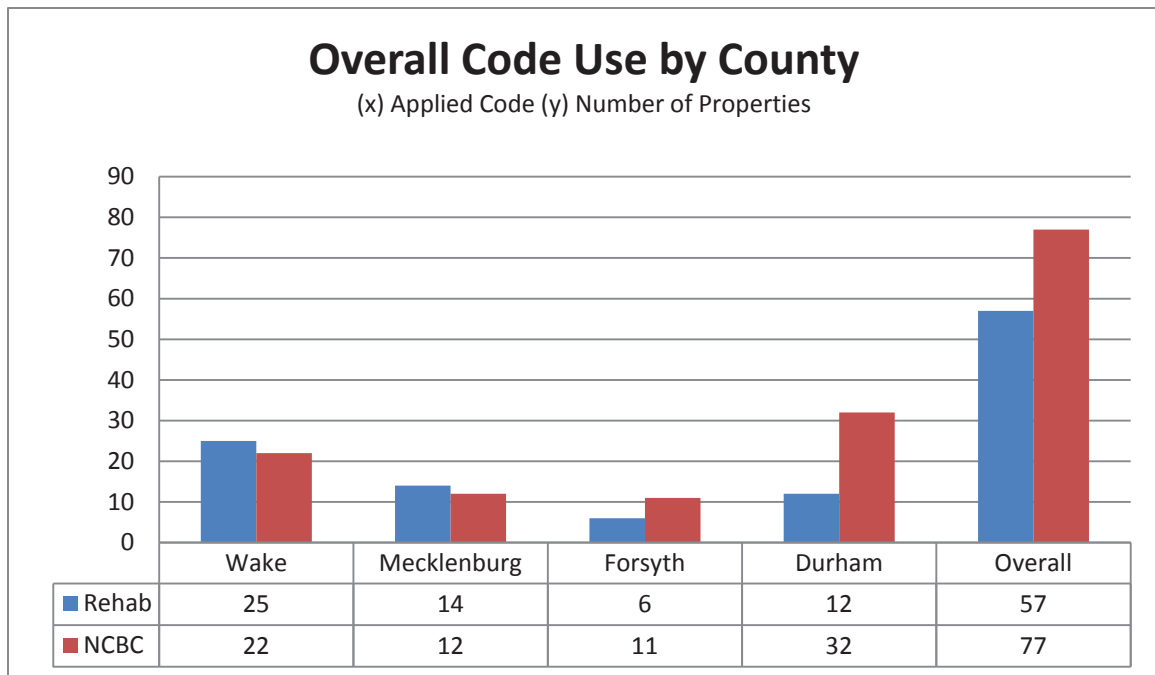
#### *Overall Findings*

- The North Carolina Building Code was chosen 57% of the time for tax credit projects, having been applied to a total of 77 projects out of 134.
- Structures made with brick and exposed steel used the NCBC 76% of the time.
- Structures constructed of brick with wood joists are the largest building stock for tax credit projects, totaling 47% of the properties analyzed.
- 71% of projects that used the Rehab Code changed their occupancy classification while only 55% of projects using the NCBC did.
- When a classification is changing from almost anything besides an industrial use, the Rehab Code is selected more frequently.
- Architects who have experience working on preservation tax credit projects vary on code preferences from firm to firm, with the application of codes used split equally overall.

- Architects who work with preservation tax credit projects support the overall findings for code applications when changing the occupancy type.
- The North Carolina Building Code can save money when it comes to small-scale projects (0-4,000 sqft) while the Rehab Code is more cost-effective for medium-sized properties (4,000 – 20,000 sqft). Larger-scaled projects vary between the two.
- There is no clear correlation between using the Rehab Code or the NCBC when applying for the NC Mill Bill as well as the Preservation Tax Credit

#### *Building Codes Used on Tax Credit Projects*

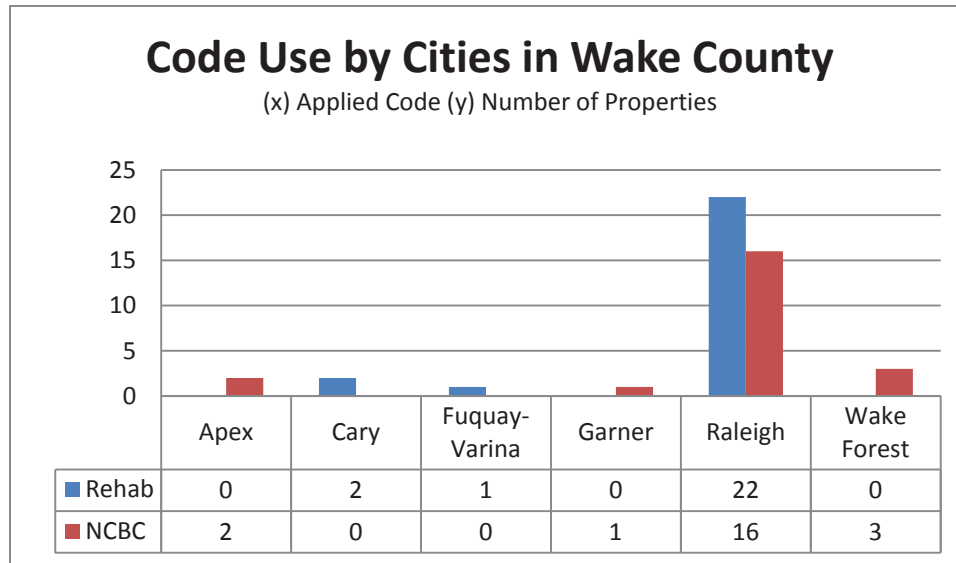
The ten-year time period from 2002 through 2012 provided a total of 134 preservation tax credit projects within the four counties included in this database. This number breaks down into 57 Rehab Code projects and 77 NCBC projects. Overall, 57% of these projects use the NCBC and 43% use the Rehab Code. Of these four selected counties, Wake County completed the most preservation tax credit projects since 2002, equaling a total of 47 properties, 25 Rehab Code and 22 North Carolina Building Code (NCBC). Durham County completed a total of 44 projects: 12 Rehab Code and 32 NCBC. Forsyth completed 17 projects: six Rehab Code, eleven NCBC. Finally Mecklenburg County completed a total of 26 projects: 14 rehab code, 12 NCBC.



**Figure 9. Overall Code Use by County – analyzing all tax credit projects in this study**

Overall 43% of the selected properties use the Rehab Code, but the proportion varies from county to county. Separating the projects by county, the breakdown becomes: 53% of projects in Wake and Mecklenburg County, 35% of projects in Forsyth, and 28% of projects in Durham use the Rehab Code.

The researcher discovered that county inspectors are the main source for building inspections within the state of North Carolina. Durham and Mecklenburg use county inspectors. Forsyth, minus Kernersville, also uses county inspectors. Out of the four chosen counties, only Wake uses city inspectors. Therefore a comparison of the use of city and county inspectors can be made using these four counties.

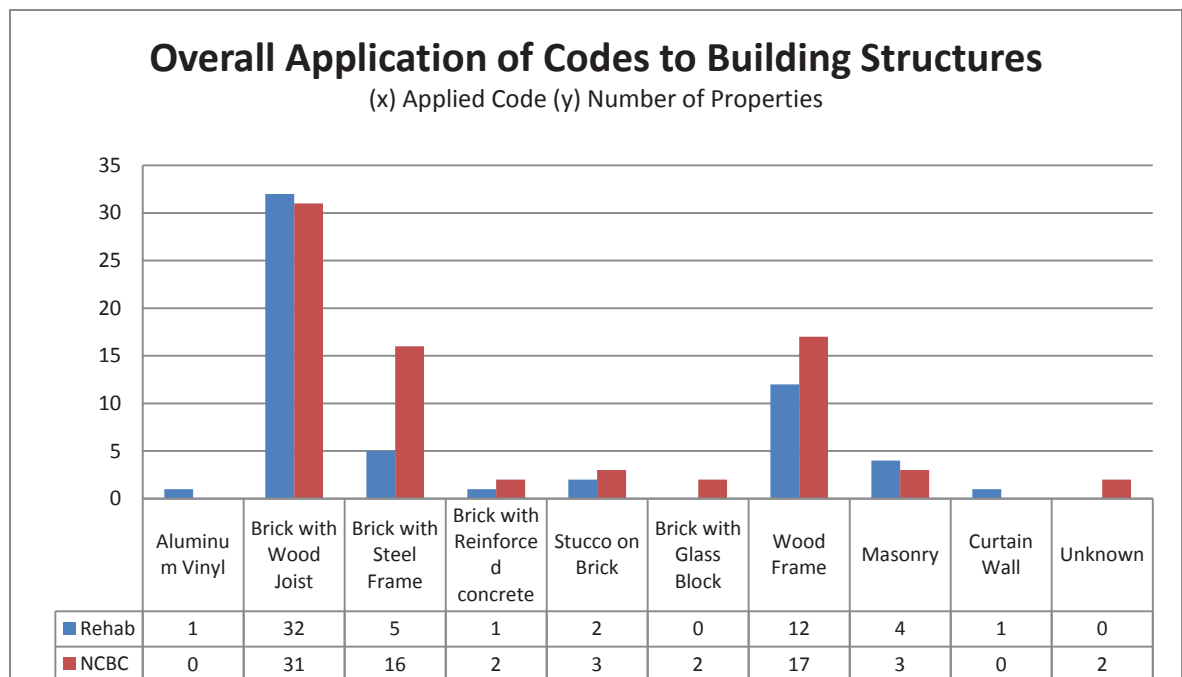


**Figure 10. Code Use by Cities in Wake County**

Wake County is the only county with tax credit projects located in multiple cities; the other three counties only had projects located in two or fewer cities. Forsyth County only had projects located in their major city of Winston-Salem, except one project in Kernersville (which supplies its own inspectors). Mecklenburg County was very similar in that the majority of the projects were located in its largest city, Charlotte. All of the projects within Durham County were located within the city of Durham.

#### *Types of Building Structures*

Analyzing a building's construction type in relationship to the code applied is important because the fire resistance capabilities of some construction types influence the decision.



**Figure 11. Overall application of Codes to Building Structures**

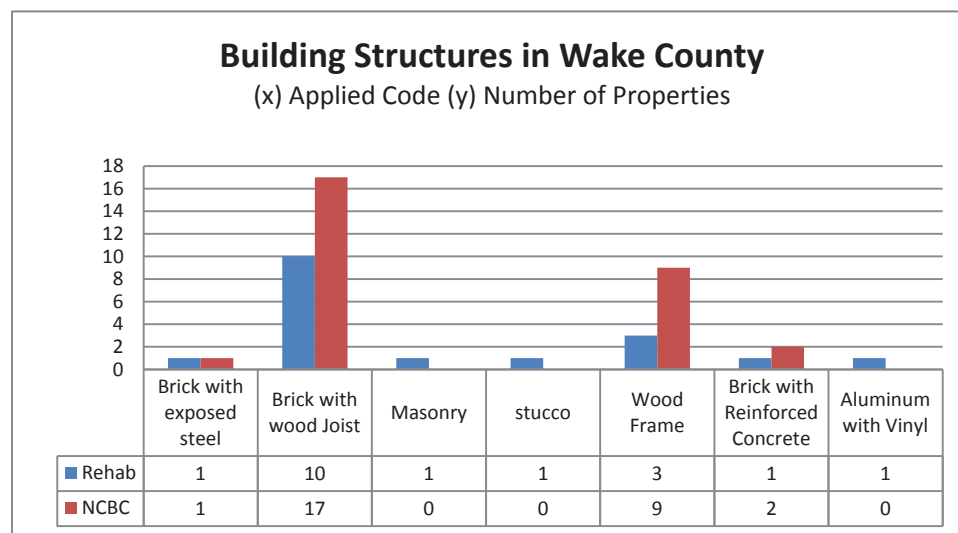
This bar chart reveals there is a clear distinction in code application based on construction type. When it comes to brick buildings with steel frame structures, 76% of those projects used the NCBC. All of these buildings are classified as industrial structures; therefore, they were built to meet a higher standard of fire protection. Industrial buildings have to maintain a certain level of fire resistance due to the types of products that can be stored, produced, or manufactured inside them. Within this study, there are three other industrial buildings being analyzed, all of which are brick structures with wood joists. One of these projects used the Rehab Code while the other two followed the NCBC.

Figure 6 also reveals the differentiation found in the codes applied to wood-frame structures. Brick structures with wood joists were the largest building stock within the gathered data. The NCBC is applied to 58% of the projects that are classified as wood-frame structures. However, this is not statistically significant. Although there appears to be a difference between



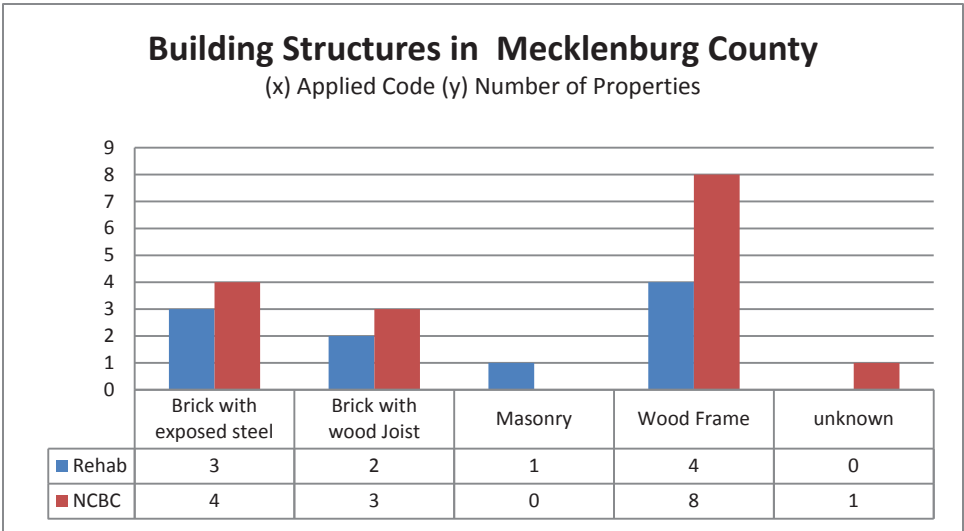
the codes applied, it is not a large enough separation to conclude that the NCBC will always be applied more often to wood-framed structures. Therefore, additional research would be necessary to support this pattern. Approximately 47% of the analyzed properties were constructed of brick with wood joists, but there is almost an equal distribution of code application between the projects. This is important to note so that later on this information can be referenced when comparing a property's change of use.

Separating the structure types by county revealed what type of building stock is found in each county and whether or not the code applied to these structures varied.



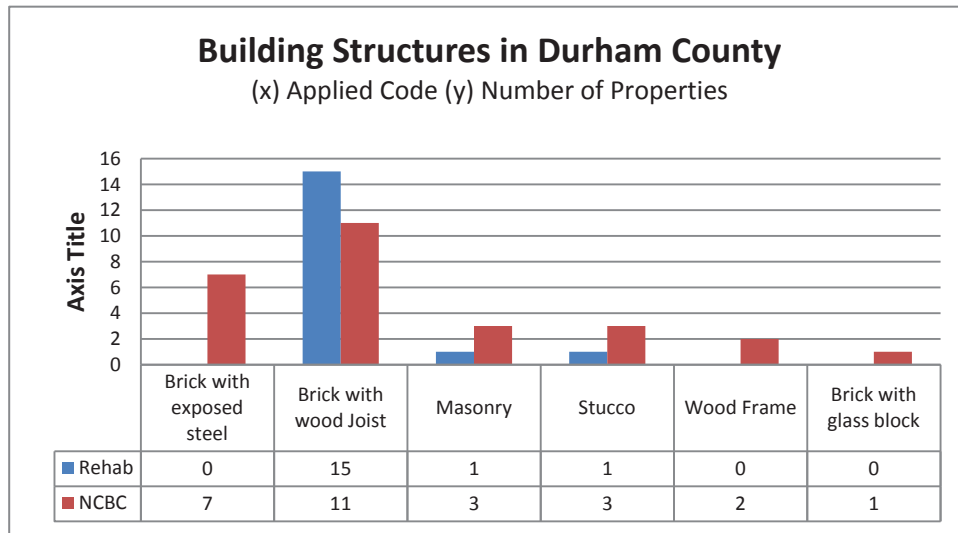
**Figure 12. Building Structures in Wake County**

Within Wake County, there is a clear distinction to the codes used on structures composed of brick with wood joists and wood-framed buildings. This chart reveals that approximately 57% of the projects in Wake County are brick structures with wood joists and that 63% of these projects used the NCBC. This is unlike Figure 6, where there is no clear distinction between the application of codes. In Wake County, 25% of the building stock is wood-frame structures and 75% of them used the NCBC.



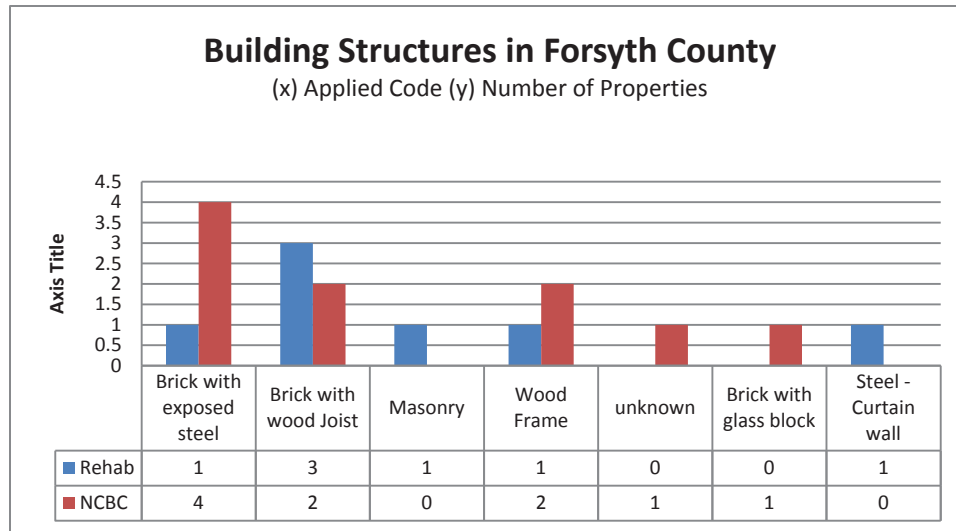
**Figure 13. Building Structures in Mecklenburg County**

Mecklenburg County also shows a larger contrast between the application of codes for wood-framed structures. Around 46% of the buildings selected from Mecklenburg County are wood-framed, and of these 66% use the NCBC. This is the only type of structure in Mecklenburg that creates a statistically significant difference between the applied codes.



**Figure 14. Building Structures in Durham County**

There is a noticeable difference in Durham County between the application of codes for structures that are classified as brick with exposed steel. These buildings only make up 16% of the projects but 100% of them use the NCBC. There is a difference when it comes to brick structures constructed with wood joists, which make up 59% of the rehabilitation projects. However, this is not statistically significant except to note that 57% of these projects use the Rehab Code, which contrasts with the results in Mecklenburg and Wake counties.



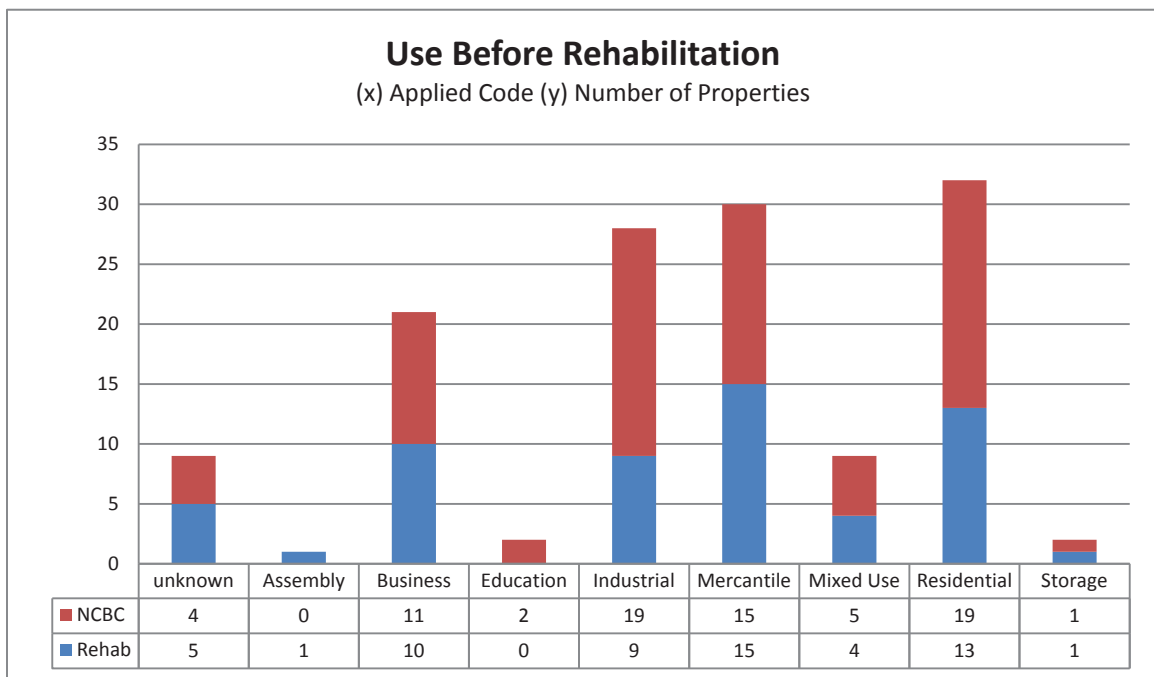
**Figure 15. Building Structures in Forsyth County**

Forsyth County is similar to Durham in that brick buildings with wood joists apply the Rehab Code 60% more often, but not to the extent that it is statistically significant. What this chart does show is that brick with exposed steel and brick with wood joists each make up 29% of the building stock of the selected properties. Overall 80% of the brick structures with exposed steel used the NCBC.

By separating the type of structures by county, the charts reveal that although one county may prefer to use the NCBC more often than the Rehab Code on a particular structure type, this can vary from county to county. This can be seen in brick structures with wood joists. Forsyth and Durham counties use the Rehab Code and Mecklenburg and Wake counties use the NCBC. The data gathered also reveals that some structures are more suited for a particular code. This can be seen when it comes to brick structures with exposed steel. These projects use the NCBC 76% of the time.

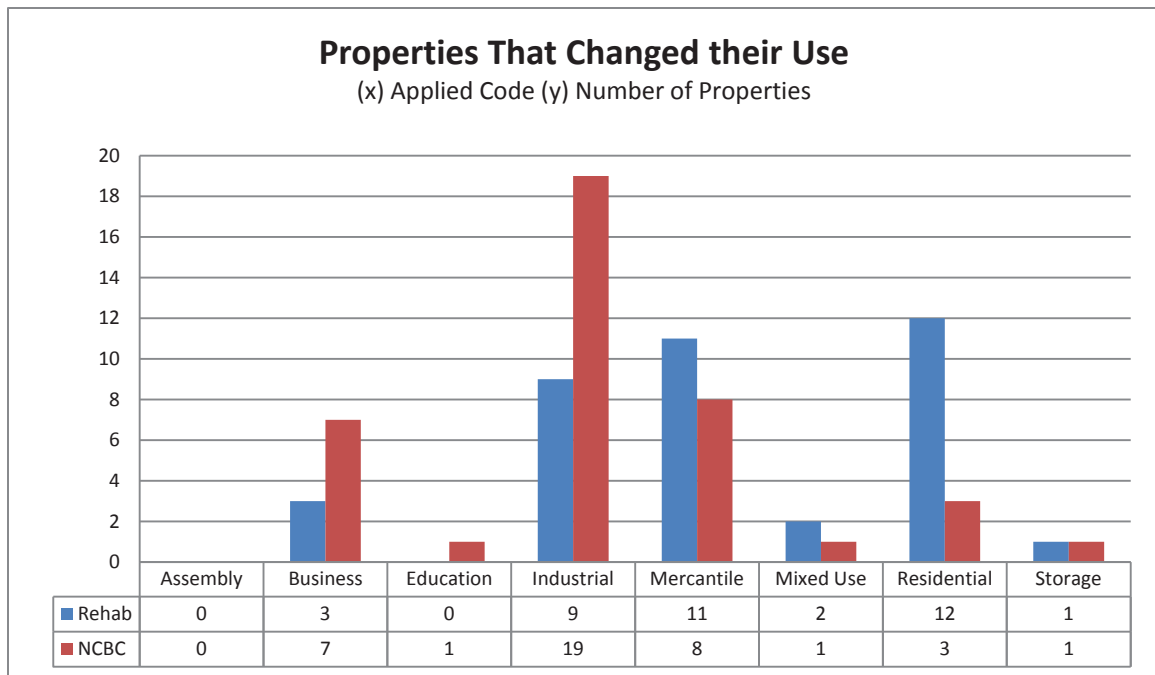
### *Building Occupancy Classification*

Another factor that needs to be taken into consideration when choosing a building code is for what occupancy classification the building was zoned and if the project changed the occupancy. This was taken into consideration and analyzed by looking at the change of use within the projects.



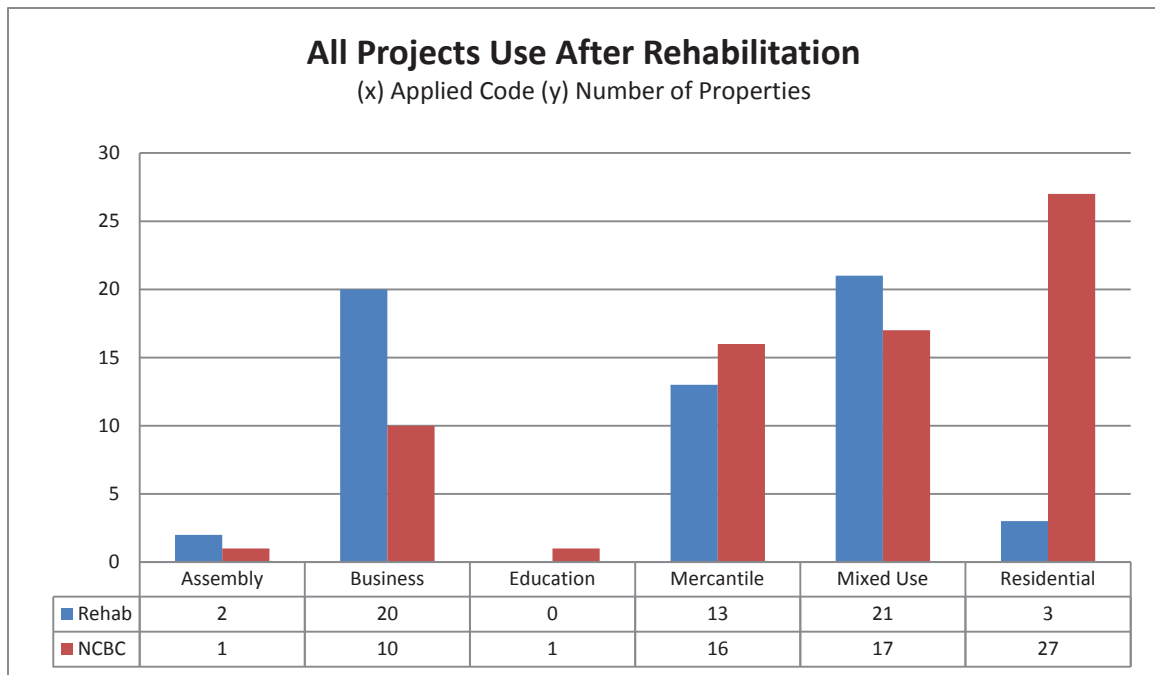
**Figure 16. Use of all Buildings in the Study before the Rehabilitation**

In the sample, the majority of the original uses of the analyzed properties fell into the categories of mercantile, industrial, business, or residential (residential properties meaning those that used something other than the NC Residential Code and therefore were either changing their use or consisted of two or more dwellings). There are also nine properties whose use before the rehabilitation is unknown, leaving 125 properties to be analyzed in this section.



**Figure 17. The original use of properties whose occupancy classification was altered**

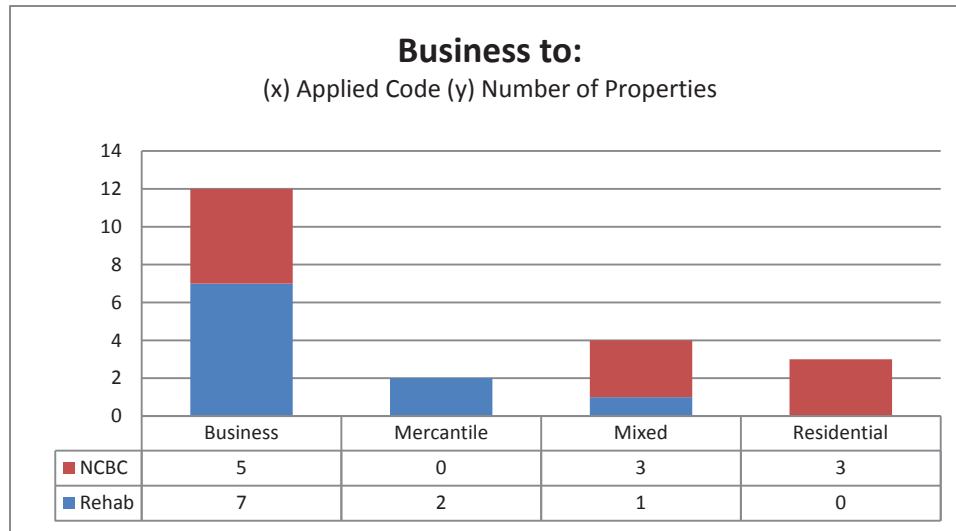
The chart in Figure 17 displays the structures whose original use was altered during the rehabilitation process. It shows that all of the industrial properties changed their use, while the assembly projects remained the same. This data reveals that out of the 125 properties, 78 changed their use, with 38 properties using the Rehab code and 40 properties using the NCBC. Therefore, 62% of the analyzed properties altered the use of the structure during the rehabilitation project. Out of the 78 properties that changed their use however, the applied codes are statistically comparable. Overall, 57 of the properties used the Rehab Code, 38 changed their use, equaling 71%. Out of the 77 projects using the NCBC, 40 changed their use, totaling 55%. Therefore, this data reveals that the Rehab Code is most often used when the buildings use is being changed.



**Figure 18. The occupancy classification for all properties after the rehabilitation process**

This chart in Figure 18 shows the uses of the projects after the rehabilitation, revealing that when a project's use changes to or remains residential, 93% of the properties chose the NCBC. But when a project changes or remains a business classification, 66% of the properties selected the Rehab Code.

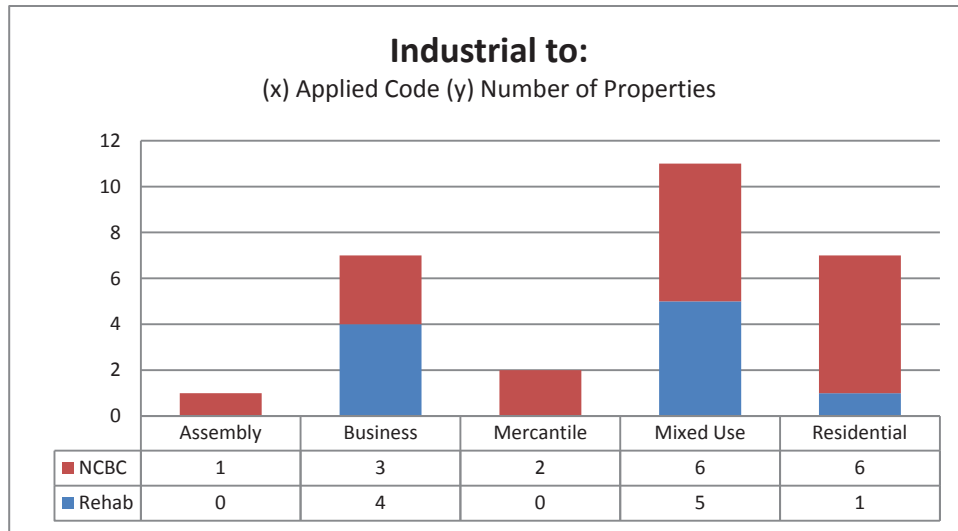
The following charts will display the change of occupancy classification in relationship to the application of the codes for the five largest groups: Business, Industrial, Mercantile, Mixed Use, and Residential.



**Figure 19. The transition of structures whose use originated as business – either remaining the same or changing to mercantile, mixed use, or residential**

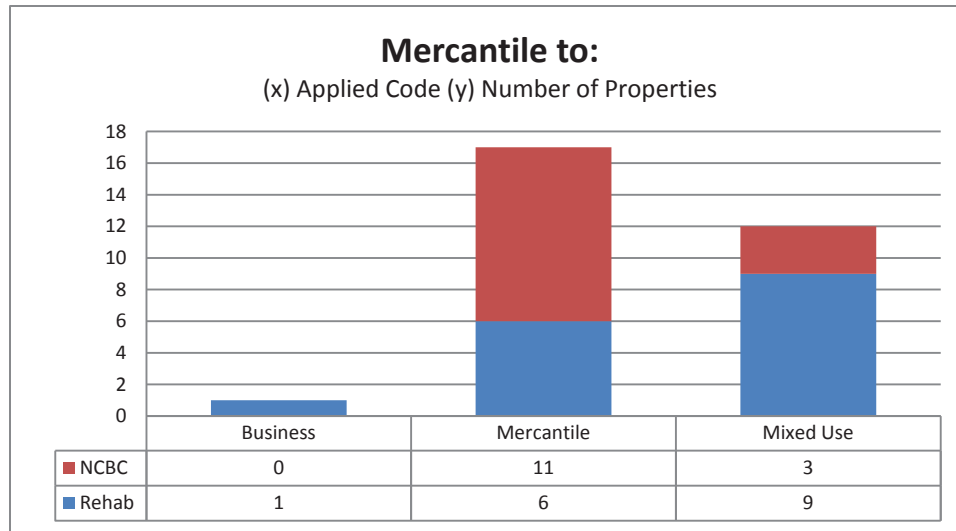
From the analyzed data, 57% of business projects maintained their classification; of these projects 58% used the Rehab Code. Overall, 52% of the projects used the NCBC and 48% used the Rehab Code.





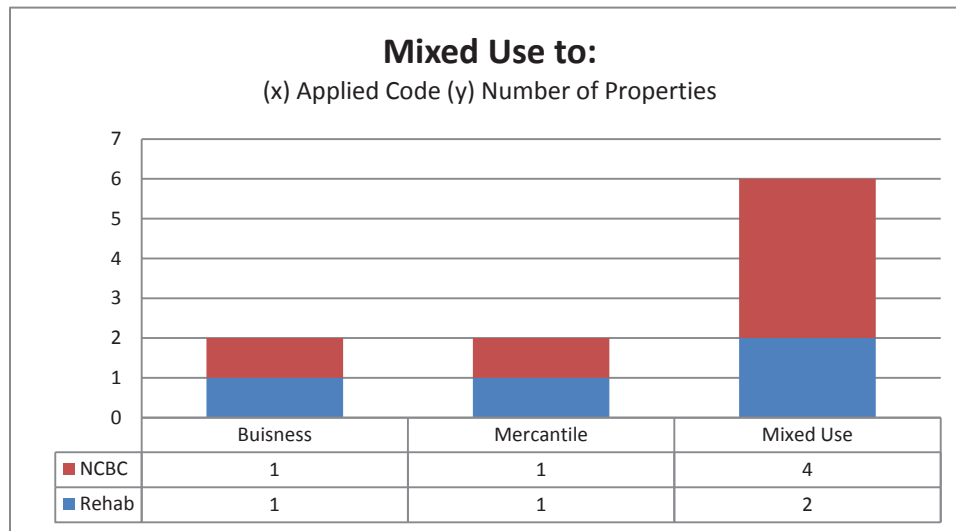
**Figure 20. The transition of structures whose use originated as industrial – either remaining the same or changing to assembly, business, mercantile, mixed use, or residential**

Because mills (and their auxiliary buildings) are no longer economically viable, none of the industrial structures maintained their original classification. Of these projects, 40% adapted to a mixed-use space, 25% changed to a business, and 25% became residential. Overall, 64% of these projects used the NCBC for their transformation. This difference in the applied code can be attributed to a number of factors, one of which is the limitation and liabilities attributed to the scale of the projects. In these cases, neither the code official nor the architect wanted to be liable when determining life safety issues (Register, 2013b).



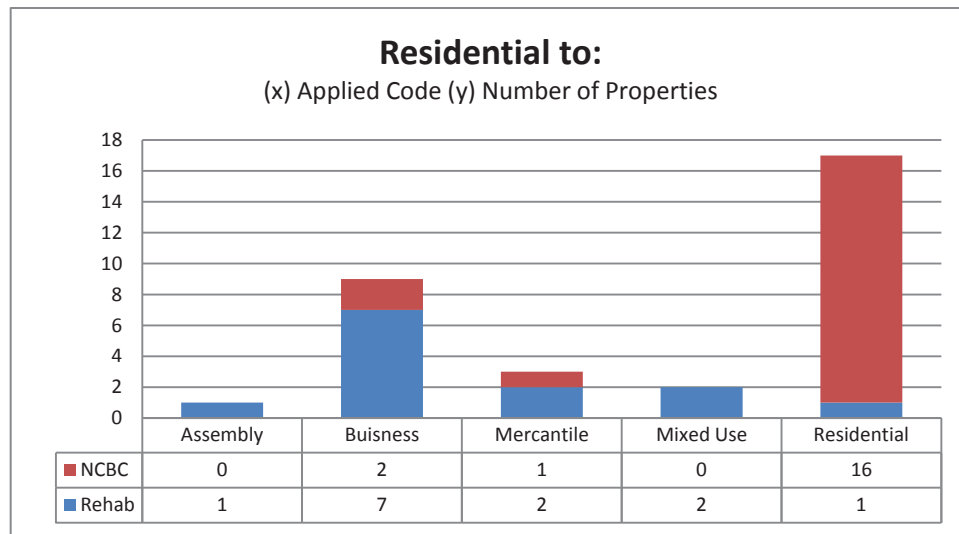
**Figure 21. The transition of structures whose use originated as mercantile – either remaining the same or changing to business or mixed use**

The chart in Figure 21 reveals that 56% of mercantile properties maintained their classification, and that 65% used the NCBC. It also indicates that 40% of the properties became mixed-use spaces, with 75% of the projects using the Rehab Code. Similar to Figure 19, business and mercantile buildings have a tendency to either maintain their original use or change to a mixed-use space. This is often caused by the owner's need to transform the second floor of their building (Jackson, 2003).



**Figure 22. The transition of structures whose use originated as mixed-use – either remaining the same or changing to business or mercantile**

Ten rehabilitation projects started out with the classification of mixed use and 60% of these properties maintained this occupancy type. Of these properties, 66% used the NCBC. Most projects that originated with a mixed-use occupancy type did not tend to alter their program. Approximately 53% of residential classification maintained their occupancy type, with 94% using the NCBC. The individual homes were more likely to change their occupancy type to business; 28% of these projects fall under this category, with 77% of them using the Rehab Code.



**Figure 23. The transition of structures whose use originated as residential – either remaining the same or changing to assembly, business, mercantile, or mixed use**

Overall these charts reveal that when a structure is maintaining its classification of residential, mercantile, or mixed use the NCBC tended to be the applied code. This is not true when it comes to the business classification. There is almost an even split between the application of the codes, with the Rehab Code being slightly favored. When a classification is changing from almost anything besides an industrial classification, however, the Rehab Code tends to be selected. Both of these results could be caused by the knowledge that the Rehab Code provides better leniency when it comes to partial rehabilitation projects which can be classified as a second floor or an attached space altering its occupancy classification, while projects that are retaining their occupancy classification tend to be rehabilitating the entire structure (Belk, 2013).

Breaking this information up by county provides another layer of analysis. These charts reveal what code is used most often for what transition, what is the most common use being changed, and what the use is changed to.

**Table 2. Occupancy Transition in Durham County**

(x) After Rehabilitation (y) Before Rehabilitation

	Unknown		Business		Education		Mercantile		Mixed		Residential	
	R	N	R	N	R	N	R	N	R	N	R	N
<b>Unknown</b>	1							1				
<b>Business</b>			1	2			2			3		2
<b>Education</b>						1						
<b>Industrial</b>				1				1		5		1
<b>Mercantile</b>							3	6	4	4		
<b>Mixed</b>									1	2		
<b>Residential</b>												3

Within Durham County a total of twenty three project, or 52% changed their use for a total of twenty-three projects. Only 27% (12) of the total projects in Durham used the Rehab Code, while 26% of the projects changing their use relied on the Rehab Code. The two largest groups of buildings in Durham are mercantile (17) and business (10), equaling 57% of the total properties, and of these properties 15 (55%) changed their use. The end result of most rehabilitation projects within this area are mixed-use spaces (19), totaling 43% of the projects.

**Table 3. Occupancy Transition in Forsyth County**

(x) After Rehabilitation (y) Before Rehabilitation

	Unknown		Business		Mercantile		Mixed		Residential	
	R	N	R	N	R	N	R	N	R	N
<b>Unknown</b>		1							1	
<b>Business</b>				1						
<b>Industrial</b>			1			1	1	1	1	4
<b>Mercantile</b>			1							
<b>Mixed</b>							1			
<b>Residential</b>										3

Within Forsyth county, 35% of the projects used the Rehab Code and 58% of the projects changed their use. Of the properties whose use changed, 50% used the Rehab Code, conversely

all of the projects using the rehab code, minus one unknown, changed their use. Out of the 17 properties, nine changed their classification from industrial, equaling 53% of the properties within this area. This county contains the largest source of industrial buildings in this study. The end results of these rehabilitation projects tend to be residential, equaling 53% of the properties end use.

**Table 4. Occupancy Transition in Mecklenburg County**

(x) After Rehabilitation (y) Before Rehabilitation

	Unknown		Assembly		Business		Education		Mercantile		Mixed		Residential	
	R	N	R	N	R	N	R	N	R	N	R	N	R	N
<b>Unknown</b>		1				1								
<b>Assembly</b>			1											
<b>Business</b>					3	1								1
<b>Industrial</b>					1	2					2			1
<b>Mercantile</b>										2				
<b>Residential</b>			1		4		1	1	1					1
<b>Storage</b>														1

Within Mecklenburg County, 62% of properties changed their use, totaling sixteen projects.

Overall, fourteen buildings used the rehab code (54%), and 50% of projects changing their use referred to the rehab code. While 35% of the rehabilitation projects originated with the classification of residential, and by the end of the process, 46% (12) of the properties were classified as business.

**Table 5. Occupancy Transition in Wake County**

(x) After Rehabilitation (y) Before Rehabilitation

	Assembly		Business		Mercantile		Mixed		Residential	
	R	N	R	N	R	N	R	N	R	N
<b>Unknown</b>					1		2			
<b>Business</b>			2	1			1	1		
<b>Education</b>										1
<b>Industrial</b>		1	2				1	1		
<b>Mercantile</b>					3	3	4			
<b>Mixed</b>			1		1	1		2		
<b>Residential</b>			2	1	1	1	2		1	9
<b>Storage</b>					1					

Within Wake County, 48% of the properties changed their use, totaling 23 properties. Overall, 25 (53%) projects used the rehab code, and 16 (70%) of these properties changed their use. Of these selected rehabilitation projects 36% started with the classification of residential, while the end results were evenly distributed between business (19%), mercantile (26%), mixed use (30%), and residential (23%).

Overall these charts reveal that the Rehab Code is used 50% or more on projects that are changing their use, except in Durham. Most of Durham's rehabilitation projects began with the classification of mercantile or business and their main construction type were brick structures with wood frame but they still tended to choose the NCBC. The decrease in properties using the Rehab Code in this county may have resulted from the bad reputation earned by the Rehab Code when it first was adopted. In Durham County, originally an architect or engineer would have to prove why the NCBC and Chapter 34 would not work for their project before they could use the Rehab Code, creating an extra hoop to jump through (Belk, 2013). This is no longer true but it may have impacted the overall use of the Rehab Code within this county. There is obviously a clear difference between the other counties' use of the Rehab Code and Durham's use.

### *Comparison of a Building's Use to its Structure*

The three main types of structures used within this study are brick with wood joists (47%), brick with steel frame (16%), and wood-framed buildings (22%). Projects that fall within these categories provide a large enough database to compare them to how these buildings are being used before and after the rehabilitation project.

**Table 6. Occupancy Transition for Brick Structures with Wood Joists**  
(x) After Rehabilitation (y) Before Rehabilitation

	Unknown		Assembly		Business		Education		Mercantile		Mixed		Residential	
	R	N	R	N	R	N	R	N	R	N	R	N	R	N
unknown	1	1				1			1		2			
Assembly			1											
Business					2				1		1	2		1
Education								1						1
Industrial					2					1		1		
Mercantile					1				5	10	8	3		
Mixed									1	1	2	4		
Residential			1								1		1	3
Storage									1					

This chart reveals that 44% of buildings constructed with brick and wood joists originate as mercantile structures. Of this building structure, most changed or remained mercantile (34%) or mixed-use (39%) spaces with no clear distinction between the code used on the projects. This is similar to the Results seen in Figure 11, indicating that regardless of the use before or after, brick buildings with wood joists can use the two codes interchangeably. This may differ if interior elements are analyzed.



**Table 7. Occupancy Transition for Brick Structures  
with Steel Joists**

(x) After Rehabilitation (y) Before Rehabilitation

Brick with steel joist	Unknown		Assembly		Business		Mixed		Residential	
	R	N	R	N	R	N	R	N	R	N
unknown		1								
Industrial				1	1	3	3	5	1	6

The brick buildings with exposed steel were all originally classified as industrial, except one, whose use is unknown. Of these buildings, the majority were changed to mixed-use (38%) or residential (33%). When changing the structure's classification to mixed use, 62% of the projects used the NCBC, while those transitioning to residential 86% adopted the NCBC.

**Table 8. Occupancy Transition for  
Wood Structures**

(x) After Rehabilitation (y) Before Rehabilitation

	Business		Mercantile		Mixed		Residential	
	R	N	R	N	R	N	R	N
Business	2	1						
Industrial					1			
Mixed	1							
Residential	6	2	2	1				12
Storage								1

Of the wood-frame structures analyzed, 79% were originally residential properties and of these building types, they tended to become business (41%) or remain residential (45%). With the transition to business, 75% of properties applied the Rehab Code and 100% of the residential projects used the NCBC. The Rehab Code tends to be better suited for residential properties that are altering their use (Brooks, 2013).

Overall this information reveals that there is a relationship between the structure type and its original use. When it comes to rehabilitating these properties, that distinction is not as clear when it comes to the new use, but the applied code for each transition is distinctly one or the other. This information reveals that certain structures were originally built with specific purposes in mind and when these structures were adapted, the exterior structure did not influence the end use but it did influence the code used for a particular project.

#### *Architects Working on the Project*

Identifying the different codes applied by particular architects revealed certain patterns. For this thesis, the architects of nine projects were unable to be identified, leaving 125 to be analyzed. After inserting the information into a chart, architects that worked on three or more preservation tax credit projects were identified:

**Table 9. Top Architects in this Analysis**

<b>Architect</b>	<b>County</b>	<b>Rehab Code</b>	<b>NCBC</b>	<b>Total</b>
Alliance Architecture	Durham	10	0	10
Tise-Kiester Architects	Orange	6	3	9
ALB Architecture	Mecklenburg	5	3	8
Gurlitz Architectural Group	Durham	2	6	8
Center Studio Architecture	Durham	1	5	6
Belk Architecture	Durham	0	5	5
Maurer Architecture	Wake	4	0	4
Jdavis Architects	Wake	1	2	3
Lafferty Architecture	Forsyth	0	3	3
<b>Total</b>		29	27	56

Analyzing these architects decreased the number of projects from 125 to 56. This chart shows that neither code is preferred overall by architects who have worked on rehabilitation projects; it does,

however, reveal that some firms tend to work with one code or the other. With this in mind the top architecture firms were asked a series of questions:

- Can you offer an explanation of why you chose this code?
- Does your choice of code have anything to do with life safety issues such as sprinklers and stairwells?
- Do you have a perception that the inspections department favors one code over the other?

Their responses indicated the reasoning of why one code could be used more often than the other by some firms. Those firms that rely heavily on the NCBC, like Gurlitz and Center Studio, have the understanding that the “NCBC is somewhat more stringent than the Rehab Code, and most likely offers the higher level of safety. If we can use the IBC and still maintain the historic integrity of the building, that gives a somewhat greater value to the project” (Gurlitz, 2013). Firms that rely heavily on the Rehab Code, like Maurer, Alliance, and ALB, believe that “it allows a little more forgiveness for existing conditions in historic buildings” (Maurer, 2013). Belk Architecture, a firm that has used both (though not represented by this study), believes that the NCBC is most adaptable for their projects because it is prescriptive, and therefore much easier to convince inspectors that a project meets the life safety requirements (Belk, 2013). However, they believe the Rehab Code is more applicable when rehabilitating one section of a building (Belk, 2013). Overall the architects agree that their decisions are based on life safety issues, mainly dealing with avoiding the installation of fire sprinklers and options provided for stairwells (Brooks, 2013). Overall, they believe that the building code officials do not favor one code over another, and will gladly work with the architect to have the codes be met whatever route is being used.

The information was then compared to the project’s use before and after the rehabilitation with the intent to find further knowledge about why the codes were selected by each firm.

**Table 10. Occupancy Transition for Top Architects**

(x) After Rehabilitation (y) Before Rehabilitation

	Unknown		Assembly		Business		Education		Mercantile		Mixed		Residential	
	R	N	R	N	R	N	R	N	R	N	R	N	R	N
unknown	1								1		2			
Business					2	1			1		1	2		2
Education								1						
Industrial					2	1				1		2	1	2
Mercantile									5	6	6	2		
Mixed									1		1	1		
Residential			1		3	1					1			3
<b>Total</b>	<b>1</b>		<b>1</b>		<b>7</b>	<b>3</b>		<b>1</b>	<b>8</b>	<b>7</b>	<b>11</b>	<b>7</b>	<b>1</b>	<b>7</b>

Overall when these charts are compared to figure 18 the results do not vary from the norm for the end use of these occupancy types. For buildings whose end use is classified as business, 70% of the projects completed by the top architects used the Rehab Code, and for the overall analysis, 66% used the Rehab Code. Similarly, for buildings whose end use is classified as mercantile, 53% of the projects completed by the top architects used the Rehab Code, and for the overall analysis, 45% used the Rehab Code. For buildings whose end use is classified as mixed-use, 61% of the projects completed by the top architects used the Rehab Code, and for the overall analysis, 55% used the Rehab Code. For buildings whose end use is classified as residential, 12% of the projects completed by the top architects used the Rehab Code, and for the overall analysis, 11% used the Rehab Code. The individual projects can also be compared to Figure 14-18 and again the data produces similar percentage ratios. This reveals that the top architects who work with preservation tax credit projects support the code applications when changing the occupancy type.

#### *Scale and Cost of a Project*

To determine if the scale and the cost of the project influenced the decision of which code was used, the two factors of applicable projects were compared. Table 11 identifies a common curve among the projects, revealing that there is indeed a relationship between the scale and cost

of the project. This curve is where the majority of the tax credit projects are located. The curve is to be expected for the larger the project, the more money it will cost to rehabilitate the building. A chart was used to separate the Rehab Code and the NCBC, which can be seen in Table 12. The blue represents the Rehab Code while the red identifies the NCBC. The selected projects are those that fell within the identified curve. NCBC has a slight alteration to the curve, where it begins to split off into two separate sections. Then these charts were overlaid in Table 13 where the purple represents the overlapping of the two codes. Overall this chart displays that the NCBC is more effective at saving money on smaller-scale projects ranging from 0-4,000 sqft, the Rehab Code works well at saving money on the projects ranging from 4,000-20,000 sqft, and the larger-scaled projects tended to vary between the two codes. These results may be caused by the Rehab Code's ability to have fire sprinklers inserted into the project (Register, 2013b). Therefore, the scale of the project can help determine the code applied, because it can help meet the set budget, helping a company save money by choosing the correct code for the correct scale.

**Table 11. The General Curve between the  
Cost (per \$1,000) and Square Footage (per 1,000sqft) of a project**  
(x) Cost – per \$1,000 (y) Scale per 1,000 sqft

	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	9-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-200	200-300	300-400	500-600
\$0-\$50	1	1	1	2																		
\$50-\$100		1	2	1	1			1												1		
\$100-\$200		5	2	7	1	1																
\$200-\$300		3	8	2	1																	
\$300-\$400	1	1	1	2		1	1															
\$400-\$500				3																		
\$500-\$600				1	1		2			1	1											
\$600-\$700						1			1													
\$700-\$800						1	1			1												
\$800-\$900					1				2	1												
\$900-\$1,000					1		1	1	1													
\$1,000-\$2,000					1			1	1	7	5											
\$2,000-\$3,000		1						1		3	1		1	1			1					1
\$3,000-\$4,000										3												
\$4,000-\$5,000		1																1				
\$5,000-\$6,000																						
\$6,000-\$7,000										1	1											
\$7,000-\$8,000																						
\$8,000-\$9,000													1						1			
\$9,000-\$10,000														1					3	1		
\$10,000 or greater													1	1	1				4	1		

**Table 12. General Curve Broken up by Code Application –  
the Cost (per \$1,000) and Square Footage (Per 1,000 sqft)**

(x) Cost – per \$1,000 (y) Scale per 1,000 sqft

	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	9-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-200	200-300	300-400	500-600
<b>North Carolina Building Code</b>																						
\$0-\$50	1			1	2																	
\$50-\$100		1	2	1				1													1	
\$100-\$200		5	1	5		1			1													
\$200-\$300			5																			
\$300-\$400		1	1	1																		
\$400-\$500				2																		
\$500-\$600				1																		
\$600-\$700																						
\$700-\$800										1												
\$800-\$900																						
\$900-\$1,000					1		1		1													
\$1,000-\$2,000									1	3	4											
\$2,000-\$3,000		1						1		2	1		1	1			1					
\$3,000-\$4,000										2					1							
\$4,000-\$5,000		1																1				
\$5,000-\$6,000																						
\$6,000-\$7,000																						
\$7,000-\$8,000																						
\$8,000-\$9,000													1									
\$9,000-\$10,000														1					1	1		
\$10,000 or greater													1	1	1				3	1		
<b>Rehab Code</b>																						
\$0-\$50		1																				
\$50-\$100					1																	
\$100-\$200			1	2	1																	
\$200-\$300		3	3	2	1																	
\$300-\$400	1			1		1	1															
\$400-\$500				1																		
\$500-\$600					1		2			1	1											
\$600-\$700						1																
\$700-\$800							1	1														
\$800-\$900					1				2	1												
\$900-\$1,000								1														
\$1,000-\$2,000					1					4	1											
\$2,000-\$3,000										1												1
\$3,000-\$4,000																						
\$4,000-\$5,000																						
\$5,000-\$6,000																						
\$6,000-\$7,000										1	1											
\$7,000-\$8,000																						
\$8,000-\$9,000																			1			
\$9,000-\$10,000																			2			
\$10,000 or greater															1				1			

**Table 13. General Curve with Code Application –  
the Cost (per \$1,000) and Square Footage (per 1,000 sqft).**  
(x) Cost – per \$1,000 (y) Scale per 1,000 sqft

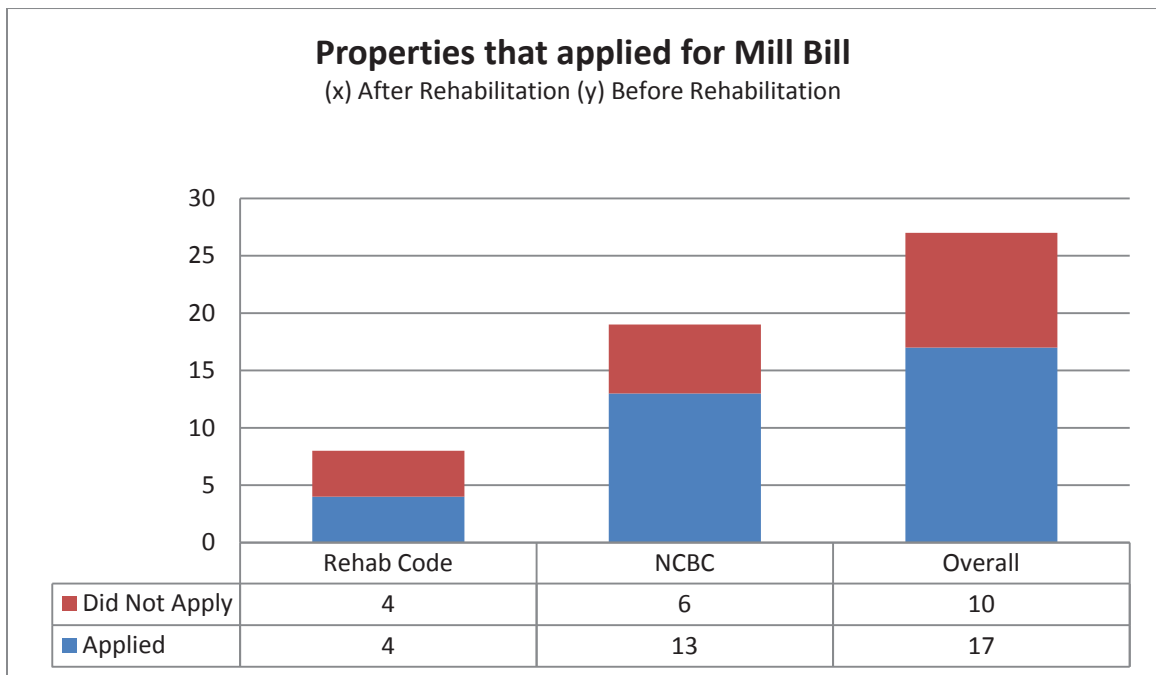
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	9-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-200	200-300	300-400	500-600
\$0-\$50		1	2	1	1			1												1		
\$50-\$100		5	1	5	1	1			1													
\$100-\$200		3	6	2	1																	
\$200-\$300	1	1	4	3		1	1															
\$300-\$400				3																		
\$400-\$500				2	1		2			1	1											
\$500-\$600						1			1													
\$600-\$700							1	1		1												
\$700-\$800					1				2	1												
\$800-\$900					1		1	1	1													
\$900-\$1,000					1			1	1	7	5											
\$1,000-\$2,000		1						1		3	1		1	1			1					1
\$2,000-\$3,000										3					1							
\$3,000-\$4,000		1																1				
\$4,000-\$5,000																						
\$5,000-\$6,000										1	1											
\$6,000-\$7,000																						
\$7,000-\$8,000																						
\$8,000-\$9,000													1						1			
\$9,000-\$10,000														1					3	1		
\$10,000 or greater			1		2					2	1		1	1	2				4	1	1	

The NCBC (Red), the Rehab Code (Blue), and the use of both (Purple) are represented in this chart



### *The Mill Bill in Relationship to Code Use*

Many historic industrial properties that are constructed with brick and exposed steel tend to be mills or their auxiliary building, and are therefore eligible for the North Carolina Mill Rehabilitation Tax Credit. Since this is another set of requirements that these properties would have to meet, it becomes another factor to take into consideration when choosing a code.



**Figure 24. Properties that could apply for the NC Mill Bill – which properties took advantage of this tax credit.**

These properties equal 20% of the buildings being analyzed in this study, with a total of 27 structures that could apply for the NC Mill Bill. Of these properties, 63% applied, 24% using the Rehab Code. A total of eight properties used the Rehab Code, 50% of which used the mill bill, while a total of nineteen properties used the NCBC, 68% of which applied for the additional tax credit. There is no clear difference between using the Rehab Code or the NCBC when applying for the Mill Bill.

### *Ad-hoc Committee Suggestions in Comparison to Results*

The biggest success, if the proposal from the ad-hoc code committee is approved, would be three methods of code compliance within one book: Compliance Method, Prescriptive Method (Chapter 34), and Performance Compliance Method (Rehab Code). This means that, unlike before, designers and architects could pick and choose elements from all the codes at once. This will assist the projects that do not have a clear distinction of which code should be applied, and would create only one code book for existing buildings within North Carolina.

The International Existing Building Code (IEBC) is created by the same committee who formed Chapter 34 within the International Building Code, therefore most elements within this code book relate to the NCBC and Chapter 34. The ad-hoc code committee, however, decided to introduce certain elements from the Rehab Code, for example the egress widths, structural loads, and hazard categories in relationship to the use classification. The data analyzed within this research shows support for these categories. The architectural firms that deal with preservation tax credit projects agree that the Rehab Code addressed the stairwell options (Brooks, 2013). Hazard categories in relationship to the use classification address the need for installation of fire sprinklers. The data provided supports this category because the Rehab Code is applied more often to projects that are changing their use.

Factors that the code officials believed to be important to include within this document are that when a mercantile occupancy is less than 12,000 sqft they should be considered less hazardous, smaller mercantile occupancies could function without the vertical shaft for protection, and the information from the North Carolina Residential Code should be introduced into this book. The inclusion would be valuable, as approximately 25% of the properties originated with a mercantile classification, while 23% ended with this occupancy type. Mercantile is one of the larger classifications when dealing with existing structures. Finally, by introducing

the North Carolina Residential Code Book, they are identifying that residential properties warrant the option to comply with this code. That is important because 25% of the projects were residential properties that could only use the North Carolina Residential Code Book, canceling these tax credit properties from the analysis above. This information included but was not limited to the egress hazards for one- and two-family dwellings.

#### *Additional Trends and Considerations*

While sufficient data was gathered from building permits, preservation tax credit project applications, and county GIS systems, there was a general uncertainty when it came to deciphering whether a project referenced Chapter 34 while using the NCBC. This is because Chapter 34 is a subsection of the North Carolina Building Code, and therefore building permits are not required to note if this section was taken into consideration. This resulted in no straightforward way to determine which projects applied this subsection of the NCBC, causing it to simply be charted as the NCBC. Therefore some of the results may be skewed in favor the NCBC, such as the conclusion that 57% of the projects chose the NCBC, when in fact some may have been using Chapter 34.

Another concern regarding the data gathered is that although the Rehab Code has been in use for ten years, it is still not as respected as the NCBC according to some of the top architects who work with preservation tax credit projects. Some architects believe, that because the NCBC is more stringent than the Rehab Code, if a project can maintain its historic integrity and use the NCBC then the project has greater value (Gurlitz, 2013). Other architects were taught to apply code analysis in order of “regular building code [NCBC], Chapter 34, compliance alternatives, and then Rehab Code” (Rhodenhiser, 2013). Having this mindset means that the Rehab Code can be seen as subpar to the NCBC and is only used if necessary possibly resulting in lowering the

number of projects that use this code with no other factors involved in the decision-making process.

Despite these issues, the Rehab Code is still considered a valuable tool when it comes to rehabilitation work, for approximately 43% of the projects apply this code. With this understanding, the Rehab Code is a solid choice in spite of its reputation among some architecture firms. As this analysis has shown, the Rehab Code has proven to be particularly helpful when changing a project's use and saving money on projects between 4,000 and 20,000 sqft. These factors may have skewed the numbers in favor of the NCBC, but taking these concepts into consideration, the Rehab Code has proven to be effective when working on tax credit projects. This can explain why the ad-hoc committee chose to keep particular aspects of the Rehab Code when considering the adoption of the International Existing Building Code.

## **CHAPTER V**

### **CONCLUSION**

This study supports the idea that the code implementation on historic tax credit projects is indeed affected by the construction material and the use before and after the rehabilitation project. These decisions are not only affected by these two factors, but are also influenced by the architect working on the project, the scale of the project, and the cost of the projects. Both the Rehab Code and the NCBC have their positives and negatives when dealing with the rehabilitation of an existing structure, and therefore with the ad-hoc code committee combining the two codes into one book, the decision becomes about evaluating the specifics for each tax credit project. The information compiled within this thesis separates the factors of a basic historic structure – its construction materials, the use before and after, the scale, and the budget – to determine how and when to mix and match the different codes to benefit the project. When this research began determining the code application based off of individual elements was not the intention but, as it developed, this became the outcome.

Additional insight could be provided by doing research on where training opportunities are provided for building inspectors, architects, and designers who are learning to do tax credit projects or about the existing building codes that this state provides. Since the selected counties were part of the pilot program, it would be interesting to see how they started spreading the word about the Rehab Code, and how they continued to inform individuals about its opportunities. Providing training services to employees at architectural firms and planning departments allows them to have a better understanding of the codes and tax credit projects and how they can be applied to different types of buildings. This information could then be cross-referenced to see

how often training sessions are held within the selected counties, and if the location moves from city to city to provide easier access to individuals living outside the main city of the particular county. Overall, analyzing this information would allow for a better understanding of how the codes are applied throughout the county.

Prospective research could include contacting the individual firms to determine whether or not Chapter 34 was referenced on each project. This would allow for the separation of Chapter 34 from the NCBC and therefore provide valuable information. The knowledge would reveal whether or not the NCBC was directly applied to the structure or if it was selected due to the value of Chapter 34 Existing Building Code. This would then provide clearer data on which elements of the code are used when approaching the rehabilitation of an existing building with the intent to maintain its historical integrity. Separating the NCBC from Chapter 34 would allow for a better understanding of elements that should be brought into the ad-hoc committee's proposal.

#### *Future Research*

This study provides the opportunity for future research to be conducted. When working with tax credit projects, it is important to maintain the historic integrity of the structure, but how would these codes be applied to projects that are not trying to receive tax credits? Would the outcome be the same or would more projects default to the NCBC? On this note, looking at projects that are not in areas that have a high density of historic properties might reflect different outcomes as well due to the knowledge about the different building codes, the opportunity to receive tax credits, and the ability to work with existing structures. By looking at projects that are not located in an area where the historic preservation tax credits have not been used or that does not have large historic districts, the outcome of how these projects apply the different types of codes may vary.

Another approach for future research would be to look at case studies where the interior spaces and elements are analyzed. This can be done by looking at the preservation tax credit project applications where a description of the proposed work is required. The results of this would provide insight into what consideration staircases, walls, fire sprinklers, and floor openings play in the decision-making process, allowing for the interior elements to be taken into consideration. Although analyzing the exterior of the buildings and general information about the project has revealed patterns, the interior spaces may provide more insight. By analyzing both and comparing the results, a more refined conclusion could be determined on how to properly select an existing building code for a rehabilitation project where the intent is to maintain its historical significance.

In addition to the ideas above, further research could be conducted simply by interviewing code officials and architects. By discussing in more depth with them their perceptions of and approach to building codes, an understanding of what is perceived versus what is reality might emerge. This idea could be expanded further by talking with code officials from counties that do not have as many tax credit projects and compare those results to officials who work with historic structures regularly. This same comparison can be done with architects, to determine their knowledge about how to work with existing structures. Overall this information can once again provide another layer to the research, to help determine a wider understanding about the application of existing building codes.

Once the IEBC is adopted by North Carolina, further research can be completed to discover its impact on historic preservation. Since this code book will have the adaptations from the ad-hoc code committee, each architect will have to compile their own selection of code elements to be applied to their particular project. With this in mind, will there be some hesitation or push back because of the elements adopted from the Rehab Code? Will these elements make

architects or inspectors nervous about the decision making process? If there are hesitations, will that slow down the rehabilitation process or will they simply begin to rely on the NCBC minus Chapter 34 for all projects? It will be interesting to see how this code book will be used.

Although this research provides the opportunity for further investigation, it has provided sound evidence that a building's construction type and use before and after the rehabilitation process can help determine what code to apply to a particular project. Furthermore, this research supports the ad-hoc code committee's idea that combining all the codes into one code book creates the best opportunity for rehabilitation projects. This research confirms that, for a rehabilitation project to be successful, the factors of construction type, occupancy classification before and after the rehabilitation, architect, county, size or scale of the proposed rehabilitation project should be considered before selecting a code.



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## **APPENDIX A**

### **THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION**

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

## **APPENDIX B**

### **PROJECT DATABASE**

This appendix contains a list of all the tax credit projects analyzed in this thesis along with the gathered data for each property. This includes the city, county, estimated cost, the applied code, the original use (use before the rehabilitation project), the new use, building construction type (building framing), gross square footage, year built, urban or rural, and city or county. This is the information that was used to compile the charts located throughout the thesis.



Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
302 W. Main Street	Durham	Durham	200000	NCBC 2002		?	Mercantile - commercial	Stucco on Frame - wood joist	20163	1915	U	County
123 West Main Street	Durham	Durham	200000	NCSBC w/ Chapter 34(2003)	Belk Architecture	Business - Office	Business - Office	Masonry	46273	1915	U	County
309 East Chapel Hill Street	Durham	Durham	150000	Rehab Code (not done)	Alliance Architecture	Mercantile - Retail	Mercantile - Discount Store	Brick with Wood Joist	26680	1914	U	County
814 Mangum Street	Durham	Durham	120000	NCBC 2002		Residential - House	Residential - Duplex horizontal split	Brick with Wood Joist	3120	1925	U	County
502 John Jones Road	Durham	Durham	100000	NCBC	Ellen Cassilly	Residential	Residential	Wood - modern	1776	1954	U	County
302-304 East Pettigrew Street	Durham	Durham	1500000	NCBC 2006 w/ Chapter 34	Belk Architecture	Industrial - Mill Warehouse	Business - Office Building	Brick with Exposed steel	53120	1952	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
West Main, West Peabody & Fuller Streets	Durham	Durham	52926915	NCBC 2002	Gurlitz Architectural Group	Industrial - Mill	Mixed	Brick with Exposed steel	?	?	U	County
407 North Mangum Street	Durham	Durham	300000	Rehab Code	Scott Harmon	Mercantile - Retail	Mixed - Retail with apartment	Brick with Wood Joist	6999	1960	U	County
113 East Main Street	Durham	Durham	225000	Rehab Code	John L Johnston	Business - Office	Mercantile - commercial	Brick with Wood Joist	2736	1920	U	County
208 Rigsbee Avenue	Durham	Durham	1500000	Rehab Code	Alliance Architecture	?	?	Brick with Wood Joist	?	?	U	County
209 Church Street	Durham	Durham	180000	NCBC	Gurlitz Architectural Group	Industrial - Warehouse	Mercantile - commercial	Brick with Wood Joist	5662	1926	U	County
115 East Main Street	Durham	Durham	220568	Rehab Code	DTW architects and planners	Mercantile - commercial	Mercantile - commercial	Brick with Wood Joist	2700	1920	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
Blackwell, Pettigrew, Carr, & Willard Streets	Durham	Durham	72000000	NCBC	Struever Brothers, Eccles and Rouse was the developer (bankrupt), W Architecture (NYC) was the architect	Industrial - Mill	Mixed - American Tobacco HH LLC. Delaware limited Liability company	Brick with Exposed steel		Fowler Building - 1939; Strickland Redrying Plant - 1946; Crowe Building - 1953; Lunch Room- 1954; Small 1950 office; Noel Building - 1930; Water Tower - 1930; Power Plant - 1929-1939; Garage - 1935;	U	County
310 Blackwell Street	Durham	Durham	72000000	NCBC	Struever Brothers and W Architecture,	Industrial - Mill	Mixed - SBER Lucky Strike LLC	Brick with Exposed steel	61040	1874, 1899, 1911	U	County
215 Morris Street	Durham	Durham	4739200	Chapter 34	Hoke/New Vision Architects	Industrial - Mill	Mixed - Commercial residential	Brick with Exposed steel	99034	1916	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
101-103 West Main Street	Durham	Durham	108500	Rehab Code	Gurlitz Architectural Group	Business - Kress Building	Mercantile - commercial	Masonry	12459	?	U	County
401-403 East Chapel Hill Street	Durham	Durham	75000	Rehab Code	Alliance Architecture	Mercantile - commercial	Mercantile - commercial	Brick with Wood Joist	6,168	1922	U	County
212 N. Mangum Street	Durham	Durham	27500	NCBC	Gurlitz Architectural Group	Fire Station #1	Mixed - Use (office/retail)	Brick with Wood Joist	7,980	1924	U	County
618 Shepherd Street	Durham	Durham	55000	NCBC	Trinity Design Build	Residential	Residential	Wood Frame	2,032	?	U	County
200 North Mangum Street	Durham	Durham	22500	NCBC	Gurlitz Architectural Group	Business - office	Mixed - Office/Commercial	Brick with Wood Joist	17,659	Between 1907-1913	U	County
107 East Parrish Street	Durham	Durham	16000	NCBC	Gurlitz Architectural Group	Mixed - Office/Residential	Mixed - Retail/Office/Residential	Brick with Wood Joist	10,505	Between 1907-1913	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
111 N. Corcoran Street	Durham	Durham	22700000	NCBC	Tise Kiester Architects	Business - Office	Residential - Hotel	masonry - Same as Kress Building	120,068	1937	U	County
324 Blackwell Street	Durham	Durham	2000000	NCBC 2006	Belk Architecture	Industrial - Powerhouse for American Tobacco Mill	Mixed - (Michael Goodman) American Powerhouse LLC	Brick with Exposed steel	25,306	1929	U	County
209-215 North Gregson Street	Durham	Durham	200000	NCBC	Heather M Wagner, Trinity Design Build (919-321-8344)	Mercantile - Commercial	Mercantile - Commercial	Brick with Wood Joist	2300	1927-1929	U	County
212 West Main Street	Durham	Durham	8700000	NCBC	Tise Kiester Architects	Business - office	Residential - Hotel	Brick With Wood Joist	46,368	1905	U	County
413 E. Chapel Hill Street	Durham	Durham	2000000	NCBC	Cliff Zinger, Play World LLC (919-821-9355)	Mixed - Retail Business	Mixed - Retail Business (not really retail)	Brick with Wood Joist	18332	1924	U	County
331-337 Main Street	Durham	Durham	1600000	NCSBC 2006 w/ Chapter 34	Belk Architecture	Business - Office	Business - Office	Masonry	26,800	1933	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
300 E. Main Street	Durham	Durham	200000	NCBC 2006	David Revere, Revere Construction LLC, davidrevere@yahoo.com	Business - County Social Service Building	Mixed - Commercial and Office	Brick with Wood Joist / Glass block facades	27,840	Mid 1920's	U	County
308 West Main Street	Durham	Durham	942000	Chapter 34	Center Studio Architecture	Mercantile - Bar Tavern Restaurant	Mixed - Residential /Commercial	Brick with Wood Joist	4800	1907	U	County
2104 Angier Avenue	Durham	Durham	90000	NCBC	Patricia E Harris, AIA (919-625-8302) The Harris Collaborative	Mercantile - Grocery, Print Shop, Church	Mercantile - Grocery	Brick with Wood Joist - attached Wood Structure	3400	1945/1980	U	County
2100 Angier Avenue	Durham	Durham	200000	NCBC	Patricia E Harris, AIA (919-625-8302) The Harris Collaborative	Mercantile - Retail Store	Mercantile - Restaurant	Brick with Wood Joist	3066	1935	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
405 E Chapel Hill Street	Durham	Durham	350000	Chapter 34	Ellen Cassilly Architect - Keith Barnhouse (919-530-1149)	Mercantile - Furniture store and pool Hall	Mixed - Business and Residential	Brick with Wood Joist	3300	1920's	U	County
322 East Chapel Hill Street	Durham	Durham		Rehab Code	Alliance Architecture	Mercantile - Commercial Retail	Mixed - Commercial Retail and office upstairs	Brick with Wood Joist	4757	1923	U	County
205 North Church Street	Durham	Durham	287500	Rehab Code	Center Studio Architecture	Business - Office	Business - Office	Stucco on Frame - wood joist	3790	1907	U	County
108-110 East Parrish Street	Durham	Durham	195000	Rehab Code	Gurlitz Architectural Group	Mixed - Office, restaurant	Mixed - Office, Restaurant	Brick with Wood Joist	4946	Before 1917	U	County
701 West Main Street	Durham	Durham	80000	NCBC	Jdavis Architects	Industrial - warehouse	Residential - apartments	Brick with Exposed steel	299100	1948	U	County
108 Morris Street	Durham	Durham	300000	Chapter 34	Center Studio Architecture	Mercantile - Bar/Tavern /Restaurant/Undertaker	Mercantile - Restaurant, Commercial	Brick with Wood Joist	13,970	1907	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
107 South Driver Street	Durham	Durham	1000000	NCSBC 2009 w/ Chapter 34	Belk Architecture	Education - Public School	Education - School, Grades K-8	Brick with Wood Joist	54,514	1910	U	County
2110-2114 Angier Avenue	Durham	Durham	90000	NCBC	Gurlitz Architectural Group	Mercantile - 3-bay Commercial	Mercantile - 3-bay Commercial	Brick with Wood Joist	2550	1950	U	County
107 East Chapel Hill Street	Durham	Durham	580196	Chapter 34	Center Studio Architecture	Mercantile - Restaurant/Retail	Mercantile - Restaurant/Retail	Stucco on Frame - wood joist	3546	1907	U	County
101 East Chapel Hill Street	Durham	Durham	1796104	Chapter 34	Center Studio Architecture	Mercantile - Bar/Tavern/Restaurant	Mixed - Residential(3)/Retail	Stucco on Frame - wood joist	9041	1907	U	County
106 Parrish Street	Durham	Durham	992561	NCBC	Center Studio Architecture	Mercantile - Commercial	Mixed - Restaurant/Commercial/Residential	Brick with Wood Joist	6860	1908	U	County
109 West Chapel Hill Street	Durham	Durham	650000	Rehab Code	Alliance Architecture	Mercantile - Commercial Retail	Mixed - Commercial Retail/Business	Brick with Wood Joist	5500	1920's	U	County



Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
320 East Chapel Hill Street	Durham	Durham		Rehab Code	Alliance Architecture	Mercantile	Mixed - Assembly/Mercantile	Brick with Wood Joist	13000	1923	U	County
301 N. Main Street	Winston-Salem	Forsyth	2500000	Rehab Code and CH 34	Gerard Perrault 331-9407	Business	Business	Steel - curtain wall	540812	1966	U	County
310-312-314 West Fourth Street	Winston-Salem	Forsyth	23000000	Rehab Code	Little Diversified Asc	?	Residential - apartments	Masonry	197894	1927	U	County
401 East Fourth Street	Winston-Salem	Forsyth	4000000	Chapter 34 - Volume 9	Piedmont Lofts (Emily)	Industrial - Mill/Warehouse	Residential - Apartments	Brick with Exposed steel	1727	1921	U	County
600 North Chestnut Street	Winston-Salem	Forsyth	15000000	Rehab Code	Tise Kiester Architects	Industrial - Old Tabacco Mill	Residential - Apartments	Brick with Exposed steel	68118		U	County
675 N. Main Street	Winston-Salem	Forsyth	10000000	NCBC	Walter Parks and Architects - Ashley Neville	Industrial	Residential - apartments	Brick with Exposed steel	144833	1920	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
109 E. Mountain Street	Kernersville	Forsyth	840000	NCBC	Owen Architects	?	?	Brick with Wood Joist			U	City
709 North Main Street	Winston-Salem	Forsyth	800000	Rehab Code	Owen Architects	Industrial - Warehouse	Business - Office	Brick with Wood Joist	4900	1920	U	County
5455 Bethania Road	Winston-Salem	Forsyth	550000	Rehab Code	Michael West Architects	Industrial - Roller Mill	Multi Use	Wood Frame	13769	1952	U	County
401 E. Fifth Street & 403 & 601 Vine Street	Winston-Salem	Forsyth	9500000	NCBC	William G MacRostie, MacRostie Historic Advisors bill@mac-ha.com	Industrial - Tobacco Manufacturing	Mercantile - Commerical Lab	Brick with Wood Joist / Glass block facades	240,000	1937	U	County
1452 North Cherry Street	Winston-Salem	Forsyth	220000	NCBC	Lafferty Architecture	Residential - Multi-Family	Residential - Multi-Family	Wood Frame	2750	1940	U	County
1462 North Cherry Street	Winston-Salem	Forsyth	220000	NCBC	Lafferty Architecture	Residential - Multi-Family	Residential - Multi-Family	Wood Frame	2750	1940	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
1638 North Cherry Street	Winston-Salem	Forsyth	220000	NCBC	Lafferty Architecture	Residential - Multi-Family	Residential - Multi-Family	Brick with Wood Joist	2520	1936	U	County
Blocks 33 & 34 and Factories 90	Winston-Salem	Forsyth	5500000	NCBC	William G MacRostie, MacRostie Historic Advisors bill@mac-ha.com	Industrial - Commercial Power Facilities	Mixed	?	122,570	1917-1920	U	County
101 East Sixth Street, 675 North Main Street	Winston-Salem	Forsyth	900000	NCBC	Walter Parks and Architects - Ashley Neville	Industrial - Vacant	Residential - apartments	Brick with Exposed steel	93169 144338	1927 1920	U	County
800 Chatham Road	Winston-Salem	Forsyth		NCBC	Tise Kiester Architects	Industrial - Warehouse	Residential	Brick with Exposed steel	314522	1920	U	County
282-290 E. Fourth Street, 308-370 N. Patterson Avenue	Winston-Salem	Forsyth	180000	Rehab Code	John Bryan Depot Street Partners (owner) Heather Fernbach contact	Mercantile - Commercial	Business Only	Brick with Wood Joist	3034	1922	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
100-106 West Fourth Street	Winston Salem	Forsyth		Rehab Code	David Gaul AIA	Mixed - Restaurant /Offices	Mixed - Apartment/ Restaurant	Brick with Wood Joist	57,675	1929	U	County
1431 West Morehead Street	Charlotte	Mecklenburg	68000	Rehab Code	unknown	Industrial	Business - Office	Brick with Exposed steel	17388	1930	U	County
1445 S. Mint Street	Charlotte	Mecklenburg	95000	NCBC	unknown	Industrial	Business - Office	Brick with Exposed steel	9198	1937	U	County
2901 N. Davidson Street	Charlotte	Mecklenburg	243000	NCBC	unknown	Industrial - apartments	Residential - Apartments	Brick with Exposed steel	123000	1900	U	County
400 S. Summit Avenue	Charlotte	Mecklenburg	29000	Rehab Code	Allen L Brooks, ALB architectur e (704-494-4400)	Residential	Business - Office	Wood Frame	1456	1925	U	County
800 West Hill Street	Charlotte	Mecklenburg	30000	NCBC	unknown	Industrial	Business - Office	Brick with Exposed steel	69390	1920	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
909 East Boulevard	Charlotte	Mecklenburg	61494	Rehab Code	Allen L Brooks, ALB architecture (704-494-4400)	Residence	Business - Office	Wood Frame	4562	1936	U	County
1027 East Boulevard	Charlotte	Mecklenburg	50000	Rehab Code	Allen L Brooks, ALB architecture (704-494-4400)	Residential	Business - Office	Wood Frame	1724	1931	U	County
216-218 Mallard Creek Church Road	Charlotte	Mecklenburg	300000	NCBC	Home Owner	storage	residential	Wood Frame	1100		U	County
2601 East Seventh Street	Charlotte	Mecklenburg	825000	Rehab Code	unknown	Business - Office	Business - Office	masonry - Stone	9685	1940	U	County
315 E. Worthington Ave.	Charlotte	Mecklenburg	150000	Rehab Code	unknown	Residential	Business - Office	Wood Frame	3159	1905	U	County
311 East Twelfth Street	Charlotte	Mecklenburg	1500000	NCBC	unknown	?	?	Brick with Exposed steel	?		U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
926 Elizabeth Avenue	Charlotte	Mecklenburg	1200000	NCBC	unknown	?	Business - office	Brick with Wood Joist	22244	1925	U	County
1000 Seaboard Avenue	Charlotte	Mecklenburg	1000000	Rehab code	Robert Powers, Powers and company, Richard Lazes Fiber Mills LLC, Doug Hardway, Mistri Hardaway	Industrial - Vacant	Mixed - Retail/Office	Brick with Exposed steel	120,681	1904, 1920	U	County
330 East Kingston Avenue	Charlotte	Mecklenburg	32000	NCBC	unknown	Residential	Residential - Multi Family Residential	Wood Frame	3924	1900	U	County
201 Grandin Road	Charlotte	Mecklenburg	2300000	Rehab Code	Allen L Brooks, ALB architecture (704-494-4400)	Residential	Assembly - Church	Brick with Wood Joist	13230	1927	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
1000 Seaboard Street	Charlotte	Mecklenburg	10000000	Rehab code	Robert Powers, Powers and company, Richard Lazes Fiber Mills LLC, Doug Hardway, Mistri Hardaway	Industrial - Vacant	Mixed - Retail/Office	Brick with Exposed steel	120,681	1904, 1920	U	County
139 South Tryon Street	Charlotte	Mecklenburg	16500000	NCBC	Jim Donnelly, Trust Development Group LLC (704-804-0647)(Fryday and Doyne)	Business - Office Space	Residential - Condominiums	?	49,500	1967	U	County
2201 East 7th Street	Charlotte	Mecklenburg	242000	Rehab Code	Jack Joyce, Vicus Builders Inc (704-363-7139)	Residential - Duplex	Mercantile - Commercial	Wood Frame	2172	1918	U	County
814 East Boulevard	Charlotte	Mecklenburg	250000	Rehab Code	Allen L Brooks, ALB architecture (704-494-4400)	Business - Office	Business - Office	Wood Frame	3388	1910	U	County

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
219 S. Brevard Street	Charlotte	Mecklenburg	550000	Rehab Code	Terri Orsi, Pursuit Group Charlotte (704-557-5518)	Assembly - Church	Assembly - Event Center	Brick with Wood Joist	6417	1901	U	County
200 North McDowell Street	Charlotte	Mecklenburg	167174.14	NCBC	Andrew Roby Inc	Business - General Office	Business - General Office	Wood Frame	4000	1904	U	County
4717 Shamrock Drive	Charlotte	Mecklenburg	1050000	Rehab code	Caroline Naysmith (704-491-3147) (Owner) Steve Onxley	Residential - Private Residence	Business - B&B and Special Events Venue	Wood Frame	4200	1903	U	County
307 East Boulevard	Charlotte	Mecklenburg	300000	Rehab Code	John B Fryday, Fryday and Doyne (704-644-6423) Vasseur Home Design, Inc.	Business - Office	Business - Office	Wood Frame	3700	1903	U	County
159 North Trade Street	Matthews	Mecklenburg	100000	NCBC	Allen L Brooks, ALB architecture (704-494-4400)	Mercantile - Retail	Mercantile - Retail	Brick with Wood Joist	2375		U	County



Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
165 North Trade Street	Matthews	Mecklenburg	150000	NCBC	Allen L Brooks, ALB architecture (704-494-4400)	Mercantile - Retail	Mercantile - Retail	Brick with Wood Joist	1500	1900	U	County
9200 Bob Beatty Road	Charlotte	Mecklenburg	400000	NCBC	Allen L Brooks, ALB architecture (704-494-4400)	Residential	Business - Office	Wood Frame	3648	1901	U	County
421 Maywood Avenue	Raleigh	Wake	900000	Rehab Code	Mark Valand and Ryan Lockett Integrated Design	Industrial - Mill	Mixed - Commercial/ apartments	Brick with Exposed steel	172,047	1901	U	City
126-128 Forest Road	Raleigh	Wake	45000	NCBC	EARLEY, LAWRENCE	Residential - Duplex	Residential - Duplex	Brick with wood frame	3471	1920	U	City
222 S. Blount Street	Raleigh	Wake	475000	NC Building Code	New City Design Group/Empire Properties	Mercantile	Mercantile - Restaurant	Brick with Wood Joist	3480	1937	U	City
1001 Wade Avenue	Raleigh	Wake	260000	NCBC	Jdavis Architects	Business	Business - Office	Brick with reinforced concrete	84482	1952	U	City

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
116/166 1/2 N. East Street	Raleigh	Wake	250000	NCBC	CROWNE PROPERTIES LLC	Residential - Single Family Home	Residential - Single Family Home	Wood Frame	2402	1915	U	City
12/14 E. Hargett Street	Raleigh	Wake	250000	Rehab	Alliance Architecture	Mixed - Shop Downstairs	Mercantile - Restaurant	Brick with Wood Joist	4130	1906	U	City
111-113 E. Hargett Street	Raleigh	Wake	360000	Rehab	Tise Kiester Architects	Mercantile - Furniture	Mixed - Retail and office	Brick with Wood Joist	18496	1910	U	City
115-117 E. Hargett Street	Raleigh	Wake	160000	Rehab	Tise Kiester Architects	?	Mixed - Retail and office	Brick with Wood Joist	7920	1920	U	City
131-135 S. Wilmington Street	Raleigh	Wake	900000	Rehab	Tise Kiester Architects	Mercantile - Furniture	Mixed - Retail and office	Brick with Wood Joist	9380	1920	U	City
137 S. Wilmington Street	Raleigh	Wake	150000	Rehab	Tise Kiester Architects	Residential - Hotel	Mixed - Retail Office	Brick with reinforced concrete	16902	1870	U	City

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
311 & 311 1/2 Cabarrus Street	Raleigh	Wake	108000	NCBC	CAPITAL PROPERTY MNGT GROUP LLC	Residential - Duplex	Residential - Duplex	Wood Frame	1686	1910	U	City
328 W. Davie Street	Raleigh	Wake	90000	Rehab	Alliance Architecture	?	Mercantile - Restaurant	Brick with Wood Joist	7656	1936	U	City
107 West Main Street	Garrner	Wake	75000	NC	Ross Deckard	Mixed - Mercantile /Retail and some offices	Mixed - Restaurant/ assembly with residential	Brick with wood joist	14,400	1914	U	City
1028 Dorothea Drive	Raleigh	Wake	40000	NCBC	LAWRENCE , J C HEIRS	Residential - Single Family Home	Residential - Single Family Home	Wood Frame	988	1940	U	City
602 East Academy Street	Fuquay-Varina	Wake	52500	Rehab Code		Residential	Mixed - Office Retail	Brick with Wood Joist	6454	1940	U	City
705 Florence Street	Raleigh	Wake	16000	NCBC	CALDWELL, ANDY & ELAINE	Residential - Single Family Home	Residential - Single Family Home	Wood Frame	1064	1935	U	City

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
1806 Sunset Drive	Raleigh	Wake	50000	NCBC	ROBERTS, JEFFERY G	Residential - Single Family Home	Residential - Single Family Home	Wood Frame	1307	1923	U	City
307 S. Academy Street	Cary	Wake	160000	Rehab Code	New City Design Group	Residential	Business	Aluminum Vinyl with Wood Joist	2924	1907	U	City
228 Fayetteville Street	Raleigh	Wake	395000	Rehab code	Carter Worthy Commercial Real Estate Meg McLaurin megmcl@mindspring.com (919)754-0808	Business	Business - Office	Brick with Wood Joist	5040	1920	U	City
119 E. Hargett Street	Raleigh	Wake	150000	Rehab	Tise Kiester Architects	?	Mixed - stores with office	Brick with Wood Joist	13287	1914	U	City
806 McCulloch Street	Raleigh	Wake	700000	Rehab Code	Vincent Whitehurst, Architect	Business	Business - Multiple tenants	Brick with Wood Joist	7735	1933	U	City

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
19 W. Hargett Street	Raleigh	Wake	23000 00	NCBC	Architektou r - Raleigh	Business - Office	Mixed - Office retail	Brick with reinforced concrete	50508	1924	U	City
901 Glenwood Avenue	Raleigh	Wake	16500 0	NCBC	BYRD, STEVEN L	Residential - Apartment s	Residential - Apartments	Wood Frame	3051	1920	U	City
106 S. Wilming ton Street	Raleigh	Wake	35374 8	NCBC	Winstead Wilkinson Architects.	Mercantile - Restaurant	Mercantile - restaurant	Brick with Wood Joist	2,809	1910	U	City
817 Hillsbor ough Street	Raleigh	Wake	20000 00	NCBC	JOYNER, PHYLLIS M TRUSTEE	Education - school	Residential - Apartment	Brick with Wood Joist	1,846	1935	U	City
225 N. Salem Street	Apex	Wake	13500 00	NCBC 2006	Helm Builders LLC Scott McAllister scottm@he lmbuilders. com 919- 362-0011 x 111	Industrial - Tobacco and Cotton Warehouse	Mixed - Office Retail	Brick with Wood Joist	16,000	1917	U	City
20 East Hargett Street	Raleigh	Wake	25000 0	Rehab Code	Maurer Architectur e	Mercantile - Jewelry Shop	Mercantile - Retail	Stucco on Frame - wood joist	1630	1910	U	City

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
219 N. Salem Street	Apex	Wake	200000	NCBC 2006	Joseph Foresta (owner) 919-465-0128	Mercantile - Retail	Mercantile - Retail	Brick with Wood Joist	9800	1909	U	City
16 East Hargett Street	Raleigh	Wake	400000	Rehab Code	Maurer Architecture	Mercantile - Retail	Mercantile - Restaurant	Brick with Wood Joist	594	1920	U	City
214 E. Martin Street	Raleigh	Wake	150000	Rehab Code	Jdavis Architects	Mercantile - Restaurant	Mercantile - Multiple Restaurant	Brick with wood joist	11813 1st, 1680 2nd	1914	U	City
112 and 102-106 W. North Avenue	Wake Forest	Wake	75000	NCBC	Ellen Turco - eturco@circa-inc.com -919-219-1489	Mixed - Residential /commercial	Mercantile - Commercial	Brick with wood joist	2,700-house 6000-store	1876-house 1897-store	U	City
1248 S. Main Street	Wake Forest	Wake		NCBC	Nancy Van Dolsen woodhamfarm@embargmail.com 252-243-7861	Residential - Residence	Mercantile - Commercial	Wood Frame	4014	1850, 1870, 1915	U	City
427 South Blount Street	Raleigh	Wake	300000	Chapter 34	Mon Peng Yueh monpeng@clearscapes.com 919-821-2775	Mixed - Commercial/office/assembly	Mixed - Commercial/office/assembly	Brick with Wood Joist	14,250	1907	U	City

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
715 Mountford Avenue	Raleigh	Wake	198000	NCBC	Charles Wilkins Jr - Chad Wilkins@mindspring.com (919)906-4040	Residential - Vacant apartments	Residential - Apartment	Brick with wood joist	3504	1912	U	City
409 West Martin Street	Raleigh	Wake	270000	Chapter 34	John Zellweger AIA Clearscapes 919-836-0088	Industrial - Warehouse	Assembly - Non Collecting museum	Brick with Exposed steel	18,540	1915	U	City
230 Fayetteville Street	Raleigh	Wake	600000	Rehab	Maurer Architecture	Business - Bank	Mixed - Office, Restaurant, Residence	Brick with Wood Joist	25,973	1902/1928	U	City
302 S. Academy Street	Cary	Wake	200000	Rehab Code	none listed	Residential	Mercantile	Wood Frame	1729	1925	U	City
208 S. Wilington St/18 E. Hargett Street	Raleigh	Wake	800000	Rehab Code	Maurer Architecture	Mercantile -Restaurant	Mixed - Restaurant/ Office	Brick with Wood Joist	10334	1900's	U	City

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
211 West Pine Avenue	Wake Forest	Wake	120000	NCBC	Ellen Turco - eturco@circa-inc.com -919-219-1489	Residential - Apartments	Residential - Single Family Residence	Wood Frame	1672	1890/1920	U	City
3200 Hillsborough Street	Raleigh	Wake	600000	Rehab	Zack Taylor (zack@greenoaksmanagement.com) Danielle Wilson (danielle@liveoakrentals.com)	Residential - 24 unit residential	Residential - 24 unit residential	Brick with Wood Joist	24,000	1928	U	City
1407 Hillsborough Street	Raleigh	Wake	523839	Rehab Code	Vernacular Studios now Gensler	Mixed - House, Law office	Business - Dental Office	Wood Frame	4537	1912	U	City
416 South Dawson Street	Raleigh	Wake		Rehab Code to be used	Alliance Architecture	Industrial - Manufacturing	Business	masonry - Cinder Block with exposed steel	14,000	1935	U	City
223 South Wilmington Street	Raleigh	Wake	675000	Rehab Code	Jeffrey Rezeli jeff@newcitydesign.com (919) 831-1308 x 112	Mercantile - Retail Loan/Pawm Shop	Mixed - Restaurant/Office	Brick with Wood Joist	9846	1920	U	City



Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
325 South Blount Street	Raleigh	Wake		Rehab Code	Chad Parker, AIA (919)833-0250 Eddie Layton - eddie@vernacularstudio.com (insert chad)	Storage	Mercantile - Retail	Brick with Wood Joist	2800	1925	U	City
418-422 S Dawson Street and 321 W Davie Street	Raleigh	Wake		Rehab Code to be used	Alliance Architecture	Industrial - Manufacturing	Business	Brick with Wood Joist	28,000	1930, 1940, 1952	U	City
501 N. Blount Street	Raleigh	Wake	400000	Rehab	Carl Winstead carlw@wwa.us.com (919)832-2878	Residential - Residence/Office	Business - Office	Wood Frame	3866	1895	U	City

Property Address	City	County	Estimated Cost	Code	Architect	Original	New Use	Building Framing	Gross sqft	Year Built	Urban/Rural	City/County
308 East Jones Street	Raleigh	Wake	15000	NCBC	Al Weaver (owner) 919-832-6242 aweaver1@bellsouth.net Steve Schuster of Clearscapes sschuster@clearscapes.com	Residential	Business - Office	Wood Frame	2500	1877	U	City